

from the tree[81]. This genus belongs to a very ancient order and has affinities with tree ferns and cycads[185]. The ginkgo is usually slow growing, averaging less than 30cm per year with growth taking place from late May to the end of August[185]. Growth is also unpredictable, in some years trees may not put on any new growth whilst in others there may be 1 metre of growth[185]. This variability does not seem to be connected to water or nutrient availability. Trees are probably long-lived in Britain, one of the original plantings (in 1758) is still growing and healthy at Kew (1993). Plants are not troubled by insects or diseases[132, 200], have they evolved a resistance?[132]. Ginkgo is a popular food and medicinal crop in China, the plants are often cultivated for this purpose and are commonly grown in and around temples. Plants are either male or female, one male plant can pollinate up to 5 females. It takes up to 35 years from seed for plants to come into bearing[117]. Prior to maturity the sexes can often be distinguished because female plants tend to have almost horizontal branches and deeply incised leaves whilst males have branches at a sharper angle to the trunk and their leaves are not so deeply lobed[132]. Branches of male trees can be grafted onto female trees in order to fertilize them. When a branch from a female plant was grafted onto a male plant at Kew it fruited prolifically[11]. Female trees have often been seen in various gardens with good crops of fruit[K]. Seeds are marked by two or three longitudinal ridges, it is said that those with two ridges produce female plants whilst those with three ridges produce male plants[178]. Trees can be coppiced[200]. They can also be pruned into a fan-shape for growing on walls[202]. Another report says that the trees dislike pruning and will often die back as a result[238]. Special Features: Attractive foliage, Not North American native, Fragrant flowers, Inconspicuous flowers or blooms, Flowers have an unpleasant odor. The plant is heat tolerant in zones 9 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

#### 4.2.4 Malus domestica

Apple  
 3 tlin 8 cyuc 5 kcaak 4 tcan 2 dwat 9 m hkc  
 hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprik-  
 wis hpa7tmwatli xre7t hjonli

drutta Malus domestica is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit Oil OilEdible Uses: Oil Oil PectinFruit - raw, cooked or dried for later use. Apples are one of the most common and widely grown fruits of the temperate zone. There are a great many named varieties with differing flavours ranging from sour to sweet and textures from dry and mealy to crisp and juicy. There is also a wide range in the seasons of ripening with the first fruits being ready in late July whilst other cultivars are not picked until late autumn and will store for 12 months or sometimes more. See individual records for more details. The fruit of some cultivars is rich in pectin and can be used in helping other fruits to set when making jam etc[61, 142]. Pectin is also said to protect the body against radiation[201]. An edible oil can be obtained from the seed[4]. It would only really be viable to use these seeds as an oil source if the fruit was

being used for some purpose such as making cider and then the seeds could be extracted from the remaining pulp[K].

tcanta Lighting Oil Oil Pectin Teeth WoodThe fruit is a source of pectin[61, 142]. Pectin is used as a thickener in jams etc and as a culture medium in laboratories. The apple is also an excellent dentifrice, the mechanical action of eating a fruit serving to clean both the teeth and the gums[4, 269]. The oil from the seed has been used as an illuminant[269]. Wood - hard, compact, fine-grained. Used for turnery, tool handles, canes etc[46, 171, 226]. It makes an excellent fuel[226]. Espalier: tree or other plants that is trained to grow flat against a support (such as a trellis or wall).

dwatta Antibacterial Antidiarrhoeal Astringent Laxative Odontalgic StomachicThe fruit is astringent and laxative[4, 9]. The bark, and especially the root bark, is anthelmintic, refrigerant and soporific[218, 240]. An infusion is used in the treatment of intermittent, remittent and bilious fevers[4, 240]. The leaves contain up to 2.4% of an antibacterial substance called 'phloretin'[240]. This inhibits the growth of a number of gram-positive and gram-negative bacteria in as low a concentration as 30 ppm[240]. A ripe raw apple is one of the easiest foods for the stomach to deal with, the whole process of digestion taking about 85 minutes[4]. The apple juice will reduce the acidity of the stomach, it becomes changed into alkaline carbonates and thus corrects sour fermentation[4]. The apple is also an excellent dentifrice, the mechanical action of eating a fruit serving to clean both the teeth and the gums[4].

propta Seed - this species is a hybrid and will not breed true from seed, though some interesting new fruiting cultivars can be produced.. It is best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils, though if these are poorly drained there could be problems with diseases such as canker[200]. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. Tolerates a pH range from 6 to 7, preferring a range of 6.5 to 6.8[200]. The apple is one of the most commonly cultivated fruit crops in the temperate zone. The primary climatic requirements for the production of good quality fruit are warm summer temperatures, relative freedom from spring frosts, reasonable protection from the wind (especially cold north and east winds) and an evenly distributed rainfall of about 600 - 800mm per annum[200]. Good apple production has been achieved as far north as 65°, whilst about 1000 hours of winter temperatures below 7°C are necessary to initiate flower production[269]. However good quality apples can still be produced in other areas with careful management and choice of cultivars[200]. Even in tropical latitudes, the plant has succeeded at high elevations, producing fruit at elevations over 3000 metres in Ecuador for example[269]. Where space is at a premium, or at the limits of their climatic range, apples can be grown against a wall. Most cultivars will grow well against a sunny south or west facing wall, an east facing wall will suit many of the tougher cultivars and even a north facing wall can be used for early culinary cultivars[219]. A hybrid of mixed origins, including M. dasyphylla, M. praecox, M. pumila, M. sieversii and M. sylvestris, this species is very commonly cultivated in temperate areas for its edible fruit[11]. There are very many named varieties[46, 183, 200] and with careful choice of these varieties it is possible to provide freshly harvested fruit from July to December and stored fruit for the rest of the year. When chives (Allium schoenoprasum) or other alliums are grown under apple trees it can prevent or cure scab[18]. A spray of the infused leaves of Equisetum spp can also be used against scab[18, 201]. If climbing nasturtiums (Tropaeolum majus) are grown into the tree they can repel woolly aphis[18, 201].

and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

**nwatta Landscape Uses:**Firewood, Pollard, Screen, Specimen, Street tree. Prefers a good moist loamy alkaline to neutral soil but it also succeeds on slightly acid soils[200]. Grows poorly on any very dry or very wet soil[200]. Tolerates considerable exposure[125, K]. Succeeds in sun or semi-shade[188]. Plants can be transplanted quite easily, even when large, trees up to 60 years old have been moved successfully[1, 74]. Trees are very amenable to coppicing or pollarding[186]. They produce numerous suckers from the base[98]. Suckers are produced but not freely according to another report[186]. This species produces far less suckers than *T. platyphyllos* or *T. x vulgaris*[238]. This species grows well in Britain, but it rarely produces viable seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[186]. Mature trees cast a dense shade[186]. A very valuable bee plant, producing an abundance of nectar[186]. A valuable species for wildlife, there are 31 species of insects associated with this tree[24]. The leaves are very attractive to leaf aphid and these aphid produce an abundance of sweet secretions which drip off the leaves to the ground below and also attract sooty mould fungus[186]. This makes the tree unsuitable for street planting. This species, however, is less likely to become infested with aphid than *T. platyphyllos* or *T. x vulgaris*[238]. There are some named varieties selected for their ornamental value[188]. Plants in this genus are notably resistant to honey fungus[200]. **Special Features:**Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 4.2.3 Ginkgo biloba

Maidenhair Tree, Ginkgo  
3 tlin 8 cyuc 5 kcak 2 tcan 5 dwat 30 m hkuc  
htut cyutli hgaktyuctup hwicli hrasjlutnyik hpa7tli flatprik-  
wis hpa7tmwatli nyanhjen hjonli

**drutta Ginkgo biloba** is a deciduous Tree growing to 30 m (98ft) by 9 m (29ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Oil Oil SeedEdible Uses: Oil OilSeed - raw (in small quantities), or cooked[237]. A soft and oily texture[229], the seed has a sweet flavour[2, 63] and tastes somewhat like a large pine nut[237]. The baked seed makes very pleasant eating, it has a taste rather like a cross between potatoes and sweet chestnuts[K]. The seed can be boiled and used in soups, porridges etc[183, 237]. It needs to be heated before being eaten in order to destroy a mildly acrimonious principle[57]. Another report says that the seed can be eaten raw[132] whilst another says that large quantities of the seed are toxic[218]. See the notes above on toxicity for more details[237]. The raw seed is said to have a fish-like flavour[218]. The seed is rich in niacin[160]. It is a good source of starch and protein, but is low in fats[237]. These fats are mostly unsaturated or monosaturated[237].

A more detailed nutritional analysis is available[218]. An edible oil is obtained from the seed[2, 183].

**tcanta Oil Oil Soap WoodAn oil** from the seed is used as a fuel in lighting[2]. A soap substitute is produced by mixing the pulp of the seed (is the fruit meat here?) with oil or wine[178]. Wood - light, soft, it has insect repelling qualities[117].

**dwatta Antianxiety Antiasthmatic Antibacterial Antifungal Astringent Cancer Digestive Expectorant Infertility Ophthalmic Sedative Tonic Urinary VermifugeGinkgo** has a long history of medicinal use in traditional Chinese medicine, where the seed is most commonly used. These uses are mentioned in more detail later. Recent research into the plant has discovered a range of medicinally active compounds in the leaves and this has excited a lot of interest in the health-promoting potential of the plant[237]. In particular, the leaves stimulate the blood circulation and have a tonic effect on the brain, reducing lethargy, improving memory and giving an improved sense of well-being[237]. They have also been shown to be effective in improving peripheral arterial circulation[218, 237] and in treating hearing disorders such as tinnitus where these result from poor circulation or damage by free radicals[237]. The leaves contain ginkgolides, these are compounds that are unknown in any other plant species[238]. Ginkgolides inhibit allergic responses and so are of use in treating disorders such as asthma[238]. Eye disorders and senility have also responded to treatment[237]. The leaves are best harvested in the late summer or early autumn just before they begin to change colour. They are dried for later use[237, 238]. The fruit is antibacterial, antifungal, astringent, cancer, digestive, expectorant, sedative, vermifuge[117, 147, 176, 178]. The fruit is macerated in vegetable oil for 100 days and then the pulp is used in the treatment of pulmonary tuberculosis, asthma, bronchitis etc[218]. (This report might be referring to the seed rather than the fleshy fruit[K]). The cooked seed is antitussive, astringent and sedative[218]. It is used in the treatment of asthma, coughs with thick phlegm and urinary incontinence[176, 238]. The raw seed is said to have anticancer activity and also to be antitussive[176, 218]. It should be used with caution, however, due to reports of toxicity[176, 218]. The cooked seeds stabilize spermatogenesis[176].

**propta Seed** - best sown as soon as it is ripe in a cold frame or in a sheltered outdoor bed[78, 80]. The seed requires stratification according to one report[78] whilst another says that stratification is not required[80] and that the seed can be sown in spring but that it must not have been allowed to dry out[80]. Germination is usually good to fair. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first year. Plant them out into their permanent positions in the following spring[78, 80] and consider giving them some protection from winter cold for their first winter outdoors[K]. Softwood cuttings in a frame in spring[238]. Cuttings of half-ripe wood, July/August in a frame. The cutting may not grow away in its first year but usually grows all right after that[113]. Cuttings of mature wood, December in a frame[200].

**nwatta Industrial Crop: Medicinal Management: Cop-  
pice Management: Standard Minor Global Crop Staple  
Crop: Balanced carbLandscape Uses:**Firewood, Pest tolerant, Specimen, Street tree. Succeeds in most soil types so long as they are well-drained[117, 200, 202], though it prefers a rather dry loam in a position sheltered from strong winds[11]. Some of the best specimens in Britain are found growing on soils over chalk or limestone[185]. Plants flower and fruit more reliably after hot summers or when grown in a warm sunny position[202]. Established plants are drought resistant[117], they also tolerate atmospheric pollution[117, 200]. Plants can grow in poor hard-packed soil, making the male forms good candidates for street planting[229]. Trees are often used for street planting in towns, only the males are used because the fruit from female plants has a nauseous smell. The fruit contains butanoic acid, it has the aroma of rancid butter[200]. Ginkgo is a very ornamental plant[1, 117] and there are several named forms[11, 200]. This species is the only surviving member of a family that was believed to be extinct until fairly recent times. It has probably remained virtually unchanged for at least 150 million years and might have been growing when the dinosaurs were roaming the earth[237]. It is exceptional in having motile sperm[185] and fertilization may not take place until after the seed has fallen



to decompose[2, 115]. Sap - used as a drink or concentrated to make a syrup and used as a sweetener[4, 115, 183]. An edible manna is obtained from the tree[183]. No further details, does this report refer to the sap?

tcanta Charcoal Fibre Paper WoodA fibre from the inner bark is used to make mats, shoes, baskets, ropes etc[1, 13, 14, 46, 61, 100]. It is also suitable for cloth[115]. It is harvested from trunks that are 15 - 30cm in diameter[115]. The fibre can also be used for making paper[189]. The stems are harvested in spring or summer, the leaves are removed and the stems steamed until the fibres can be stripped. The outer bark is removed from the inner bark by peeling or scraping. The fibres are cooked for 2 hours with lye and then beaten in a ball mill. The paper is beige in colour[189]. Wood - soft, white, easily carved. It is very suitable for carving domestic items and small non-durable items[4, 13, 46, 61, 115]. A charcoal made from the wood is used for drawing[46, 61, 115]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antispasmodic Cholagogue Diaphoretic Diuretic Emollient Expectorant Hypotensive Sedative Skin Vasodilator Lime flowers are a popular domestic remedy for a number of ailments, especially in the treatment of colds and other ailments where sweating is desirable[9]. A tea made from the fresh or dried flowers is antispasmodic, diaphoretic, expectorant, hypotensive, laxative and sedative[4, 9, 13, 226, 238]. Lime flower tea is also used internally in the treatment of indigestion, hypertension, hardening of the arteries, hysteria, nervous vomiting or palpitation[4, 238]. The flowers are harvested commercially and often sold in health shops etc[226]. Lime flowers are said to develop narcotic properties as they age and so they should only be harvested when freshly opened[238]. A charcoal made from the wood is used in the treatment of gastric or dyspeptic disturbances and is also made into a powder then applied to burns or sore places[4].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Succeeds on poorer soils than *T. platyphyllos*[11, 14]. Tolerates considerable exposure[125]. A very valuable bee plant[11]. The flowers are toxic to bees[188]. A food plant for the caterpillars of many butterfly and moth species[30]. This tree is frequently infested by aphids[17, 200], which cover the ground and the leaves with a sticky honeydew[188]. Although a hybrid species, it does produce fertile seed in Britain[17]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Easily transplanted, even when quite large, trees up to 60 years old have been moved successfully[1, 74]. Can be coppiced, the tree produces suckers very freely[98, 200]. Grows best in a woodland situation, young plants tolerate a reasonable level of shade[200]. Plants in this genus are notably resistant to honey fungus[200]. Note: *Tilia × vulgaris* B.Heyne is a synonym of *Tilia × europaea* L. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days"

experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

#### 4.2.2 *Tilia cordata*

Small Leaved Lime, Littleleaf linden  
3 tlin 7 cyuc 5 kcaak 3 tcan 3 dwat 30 m hkuc  
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Tilia cordata* is a deciduous Tree growing to 30 m (98ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Leaves Sap Edible Uses: Chocolate Tea Young leaves - raw[2]. They make an excellent salad or sandwich filling, they are mild tasting and somewhat mucilaginous[K]. The leaves can be available from spring until early autumn from the young growths at the base of the tree[K]. A very acceptable chocolate substitute can be made from a paste of the ground-up flowers and immature fruit. Trials on marketing the product failed because the paste is very apt to decompose[2, 115]. A popular herb tea is made from the flowers, it has a sweet, fragrant pleasant flavour[46]. Some caution is advised, see the notes above on toxicity. Sap - harvested in the spring, it is sweet and can be used as a drink or concentrated into a syrup[4].

tcanta Charcoal Fibre Paper WoodA fibre from the inner bark is used to make mats, shoes, baskets, ropes etc[1, 13, 14, 46, 61, 100]. It is also suitable for cloth[115]. It is harvested from trunks that are 15 - 30cm in diameter[115]. The fibre can also be used for making paper[189]. The stems are harvested in spring or summer, the leaves are removed and the stems steamed until the fibres can be stripped. The outer bark is removed from the inner bark by peeling or scraping. The fibres are cooked for 2 hours with lye and then beaten in a ball mill. The paper is beige in colour[189]. Wood - soft, white, easily carved. It is very suitable for carving domestic items and small non-durable items[4, 13, 46, 61, 115]. A charcoal made from the wood is used for drawing[46, 61, 115].

dwatta Antispasmodic Diaphoretic Expectorant Hypotensive Laxative Sedative Skin Lime flowers are a popular domestic remedy for a number of ailments, especially in the treatment of colds and other ailments where sweating is desirable[9]. A tea made from the fresh or dried flowers is antispasmodic, diaphoretic, expectorant, hypotensive, laxative and sedative[4, 9, 13, 226, 238]. Lime flower tea is also used internally in the treatment of indigestion, hypertension, hardening of the arteries, hysteria, nervous vomiting or palpitation[4, 238]. The flowers are harvested commercially and often sold in health shops etc[226]. Lime flowers are said to develop narcotic properties as they age and so they should only be harvested when freshly opened[238]. A charcoal made from the wood is used in the treatment of gastric or dyspeptic disturbances and is also made into a powder then applied to burns or sore places[4].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy

# Plants For a Future 2021CE Hardiness Zone 6, damp soil

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hgat /hgat/ drought (tolerant), kyuc /kju/ dry, tcup /tʃup/ damp, hja7n /hʒa1n/ wet, hs6s /hs6s/ puddle, hwic /hwɪ/ water (requirement).

hyis /hɪs/ poor (soil), hras /hras/ sandy, jlut /ʒlut/ loamy, nyik /njɪk/ mud (silt/clay loam), frip /frɪp/ pottery (heavy clay), hpa7t /hpa7t/ topsoil.

frus /frus/ corrosive (very acid), flat /flat/ acid, prik /prɪk/ passive (neutral), lwis /lwɪs/ alkaline, slip /slɪp/ slippery (very alkaline), hsom /hsom/ salt (saline), hpa7tmwat /hpa7tmwat/ topsoil taste.

fyif /fɪf/ self (fertile), xre7t /gɾeɪt/, nyanhjen /njanhʒen/ male-female (dioecious, distinct male and female plants), hjon /hʒon/ sex.

hmuc /hmʊ/ purpose, trot /trot/ temperature, prop /prop/ fertile, tcan /tʃan/ other, hum /hjum/ uses, dwat /dwat/ medicine, drut /drut/ description, kcec /kʃe/ region, tof2n /toʃn/ nitrogen-fixing, xlutkʃam /xlʊt,kʃam/ plant quantity, bwon /bwon/ bean, mran /mran/ corn/grain non-nitrogen-fixing plant.

6 hmucrotkcec  
tcup hmuchwic  
2983 xlutkʃam

## 2 1 tlin

### 2.1 bwon

#### 2.1.1 Phaseolus coccineus

Runner Bean, Scarlet runner  
htu2n 1 tlin 12 cyuc 4 kcaak 3 tcan 0 dwat 3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta Phaseolus coccineus is a ANNUAL/PERENNIAL growing to 3 m (9ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 10 and is frost tender. It is in leaf from May to October, in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves Root Seed Seed Uses: Immature seedpods - raw or cooked[1, 2, 37, 46]. They have a pleasant mild flavour and are widely used as a vegetable in many areas of the world. They can be added to salads, cooked as a vegetable or added to soups, stews etc[183]. The immature seed is used like shelled beans as a vegetable[183]. The protein-rich mature seeds can be dried and stored for future use. They need to be thoroughly cooked before being eaten in order to destroy a toxic principle. They are soaked for 12 hours prior to use and are eaten boiled or added to soups etc. The seed can also be ground into a powder and added to cereal flours for making protein-enriched bread etc[183]. Flowers - raw. A bean-like taste[177, 183]. Young leaves - cooked and used as a potherb[183]. Root - cooked. Rich in starch[183]. Another report says that the root is poisonous[2]. Carbon Farming - Staple Crop: protein.

tcanta Nitrogen. Carbon Farming - Agroforestry Services: nitrogen. Attracts hummingbirds.

dwatta None known  
propta Pre-soak the seed for 12 hours in warm water and sow in mid spring in a greenhouse. Germination should take place within 10 days. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts. The seed can also be sown in situ in late spring though it may not ripen its seed in a cool summer.

nwatta Agroforestry Services: Nitrogen Management: Standard Minor Global Crop Staple Crop: ProteinAs an annual suites hardness zones 1-12. Heat zone: 12-1. As a perennial hardness zones 10-12. Requires a warm sheltered sunny position in a rich well-drained soil with plenty of moisture in the growing season[1, 16, 37, 200]. Dislikes heavy, wet or acid soils[16]. Prefers a pH in the range 6 to 7[200]. The runner bean is commonly cultivated in many parts of the world for its edible seeds and immature seedpods, there are many named varieties[183]. Most varieties are climbing plants but some dwarf forms have been developed[200]. Plants are perennials but are often grown as annuals, especially in the temperate zone. Plants flower under long day conditions, which is ideal for temperate regions[200]. When grown for their edible pods, the immature pods should be harvested regularly in order to promote extra flower production and therefore higher yields[200]. The perennial roots will survive mild winters outdoors in many parts of the country, especially if given a protective mulch in late autumn, they will then give an earlier but lighter crop the following year. They can also be dug up in late autumn and stored like dahlias in a cool but frost free place over winter and replanted in the following spring. The plants might need some protection from slugs since these creatures adore the young shoots in the spring[K]. Runner beans grow well with carrots, cauliflowers, cucumbers, cabbage, leek and celeriac[18, 20]. They are inhibited by alliums and fennel growing nearby[18, 20]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Carbon Farming - Cultivation: regional crop. Management: standard. Phaseolus coccineus ssp.polyanthus (Cache Bean) is also worth considering as a carbon farming plant. It is similar to Phaseolus coccineus but more suited to tropical highlands and semi-arid conditions.

## 2.2 mran

### 2.2.1 Pinus cembra sibirica

Siberian Pine  
1 tin 6 cyuc 4 kcaak 3 tcan 2 dwat 30 m hkuc  
htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus cembra sibirica is an evergreen Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 1. It is in leaf all year, in flower from May to June, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Oil SeedEdible Uses: Condi- ment OilSeed - raw or cooked[1, 2, 4, 34, 177, 183]. An important local food source in Siberia and China[81], the oil-rich seed has a delicious flavour with a slight taste of turpentine. A reasonable size, it is about 10mm x 8 mm[200]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200]. Carbon Farming - Staple Crop: protein-oil.

tcanta Dye Herbicide Oil WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Turpentine is obtained from the leaves[46, 61]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction eco-

nomicly worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - soft, easily worked. The timber is used for construction, furniture, turnery etc[46, 61, 100].

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Management: Standard Minor Global Crop Staple Crop: Protein-oilThrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1] - this report conflicts with the plants reported natural habitat of wet soils[81, K]. Established plants tolerate drought[200]. Plants are slow growing in cultivation[81]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones do not open, seed is extracted by breaking up the soft scales of the cone[200]. This plant is seen as a distinct species by some botanists, differing from *P. cembra* in its larger cones and by having 3 resin canals instead of one in each leaf[200]. Plants in this genus are notably susceptible to honey fungus[200]. Climate: boreal to warm temperate. Humidity: semi-arid to humid. Trees can live for 500 years. One tree can yield 1,000-1,500 cones in a year. Each cone contains 80-140 seeds. Seeds take 2 years to ripen. Carbon farming - Cultivation: minor global crop. Management: standard. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 2.2.2 Pinus contorta

Beach Pine, Lodgepole pine, Bolander beach pine, Beach pine, Sierra lodgepole pine, Yukon pine, Shor  
1 tin 7 cyuc 3 kcaak 0 tcan 2 dwat 15 m hkuc  
htut cyutli hgatkuyctcuphja7n hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

hmimhtut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikhwisslip hpa7tmwatli hjonli

drutta Genista sagittalis is a deciduous Shrub growing to 0.3 m (1ft) by 0.9 m (3ft in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known  
tcanta A good high density groundcover. Nitrogen Fixer. Location: Border, Ground Cover, Mass Planting, Rock Garden, Wildlife Garden, Woodland Garden. A very hardy, mat-forming plant for the rock garden. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2].

dwatta None known  
propta Seed: Easy. Cover seed and germinate at 55-65F/13-18C. Chipping and soaking may aid germination. Do not transplant. Cuttings taken in summer, or by simple layering. Tip cuttings about 3-6 cm may be taken in mid-summer and rooted in a mist chamber or shaded frame.

nwatta A prostrate, very hardy, sometimes spiny, deciduous shrub or small tree that forms a wide mat of flattened, upright stems. It requires full sun and a very well-drained soil. Soil: Sand, Chalk, Loam. In the wild, it often grow on limestone but in cultivation, it is not too particular about soil pH as long as it is not too acidic. pH: Acid, Alkaline, Neutral. Exposure: Exposed or Sheltered. Upper elevation limit: 2,700 metres. Lower elevation limit: 0 metres. Blooming Period: April in the south to July in the north. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2].

### 4.1.28 Alnus maritima

Seaside Alder, Beach Alder  
tfo2n 3 tin 7 cyuc 0 kcaak 0 tcan 0 dwat m hkuc  
htut cyutli tcuphja7n hwicli hysljutnyikfrip hpa7tli flatprik-lwshsom hpa7tmwatli hjonli

drutta Alnus maritima is a deciduous Tree growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 7. It is in flower from September to October, and the seeds ripen in May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known  
tcanta Biomass WoodThis species has the potential to be used as a biomass crop[269]. Wood - light, soft, close-grained. Light brown in colour with thick, hardly distinguishable heartwood[82].

dwatta None known  
propta Seed -  
nwatta Landscape Uses:Erosion control, Massing. Prefers a heavy soil and a damp situation, but it succeeds in ordinary garden soil[11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. Trees are tolerant of frost, poor soil, and some salinity and water-logging[269]. Seaside alder is reported to tolerate an annual precipitation in the range of 95 to 400cm, an average annual temperature of 13.5 to 18°C, and a pH in the range of 6.1 to 8.1[269]. This species has a symbiotic relationship with certain soil microorganisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features: North American native, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients

and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 4.1.29 Desmodium canadense

Showy tick-trefoil  
tfo2n 3 tin 6 cyuc 0 kcaak 3 tcan 0 dwat 0.9 m hkuc  
hmimhtut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli frusflatprikhwisslip hpa7tmwatli hjonli

drutta Desmodium canadense is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 4. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known  
tcanta Nitrogen Fixer: A member of the Legume Family, it improves the soil by adding nitrogen. Dynamic Accumulator: Deep Taproot. Wildlife Food: The seeds are used by a variety of birds and other wildlife. Like many other members of the Bean family, this plant is highly edible to various mammalian herbivores, including deer, rabbits, groundhogs, and livestock. Some upland gamebirds and small rodents eat the seeds, including the Bobwhite, Wild Turkey, and White-footed Mouse. Insectory: Cut flowers.

dwatta None known  
propta Seed. Stratify seed at 33-38 deg. F for 10 days, need scarification.

nwatta An erect herbaceous perennial forb. Sun: Full Sun, Partial Shade. Soil Type: Loamy, Silty. Soil Moisture: Moderate, Dry. Soil pH: 5.0 - 8.0. Indifferent to soil acidity. Growth Rate: Moderate. Life Span: Long-Lived Perennial. Stand Persistence: Long. Form: Upright. Texture: Medium. Minimum Root Depth: 0.2m or 8 inches. Root Type: Rhizome. Seasonal Interest: Summer. Fruit Type: Pod. Flower Color: Pink. USDA Hardiness Zones: 3 - 8. Drought: Tolerant. Flood: Moderate. Salt: Moderate. Soil Compaction: Moderate. Mowing: Tolerant. Fire Damage: Tolerant. Cold Injury: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Growing Season: Warm. Bloom Time: Summer - Late Summer [318-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2 mran

### 4.2.1 Tilia x europaea

Linden, Common Lime  
3 tin 9 cyuc 5 kcaak 3 tcan 3 dwat 35 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprik-lw hpa7tmwatli xre7t hjonli

drutta Tilia x europaea is a deciduous Tree growing to 35 m (114ft) by 15 m (49ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Manna SapEdible Uses: Chocolate Sweetener TeaYoung leaves - raw[6, 177, 183]. Excellent in salads, they are mild and mucilaginous. A refreshing tea is made from the dried flowers[183]. A honey-like fragrance[183]. Some caution is advised, see notes above on toxicity. Flowers - used as a vegetable[183]. A very acceptable chocolate substitute can be made from a paste of the ground-up flowers and immature fruit. Trials on marketing the product failed because the paste is very apt

slightly acid soil in full sun[188, 200]. Grows freely in a loamy soil[1]. Succeeds in a hot dry position. Succeeds in a rich moist soil in sun or light shade[187]. Plants are hardy to about -20°c[187]. A very ornamental species, but it is somewhat shy flowering in British gardens[1]. Plants have a very deep root system and dislike root disturbance, they should be left alone once they are established[188, 233]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attracts birds, Attractive foliage, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

#### 4.1.24 Baptisia pendula

White False Indigo, False Indigo  
 tf02n 3 tlin 9 cyuc 0 kcak 0 tcan 0 dwat 1 m hkcuc  
 htut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Baptisia pendula is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from May to October, in flower from June to July. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
 tcanta DyeA blue dye is obtained from the leaves. It is an indigo substitute but a lot of leaves are required for even a little indigo[169].

dwatta None known  
 propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed should be pre-soaked for 24 hours in warm water and then sown in a cold frame in late winter or early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer or following spring. Division in spring[188]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Border, Massing, Specimen. Prefers a deep, well-drained neutral to slightly acid soil in full sun[200, 233]. Grows freely in a loamy soil[1]. Shy flowering in British gardens[1]. Plants have a very deep root system and dislike root disturbance, they should be left alone once they are established[188, 233]. This species might be no more than a synonym for Baptisia alba var. alba. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attractive foliage, North American native.

#### 4.1.25 Vicia caroliniana

Carolina vetch, Carolina wood vetch  
 tf02n 3 tlin 9 cyuc 0 kcak 4 tcan 2 dwat 0.6 m hkcuc  
 pcmhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Vicia caroliniana is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Insects. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta  
 tcanta Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. Host plant for Northern Cloudywing butterfly. Seeds may be eaten by songbirds. Nitrogen Fixer. Dynamic accumulator.

dwatta In the US, the Cherokee use Carolina wood vetch for a variety of medicinal purposes. It is used for back pains, local pains, to toughen muscles, for muscular cramps, twitching and is rubbed on stomach cramps. They also use a compound for rheumatism, for an affliction called "blacks", and it is taken for wind before a ball game (Hamel and Chiltoskey 1975 Cherokee Plants and Their Uses). An infusion is used for muscle pain, in that it is rubbed on scratches made over the location of the pain. An infusion is also taken as an emetic. It is also used internally with Pseudognaphalium obtusifolium ssp. obtusifolium for rheumatism.

propta Seed.

nwatta An attractive perennial, herbaceous vine generally sprawling, occasionally climbing stems with tendrillate leaf tips. Light: Full sun (6 or more hours of direct sunlight a day) to partial shade (direct sunlight only part of the day, 2-6 hours). There is some suggestion that it can take deep shade but we have been unable to confirm this. Soil Drainage: moist and well-drained, occasionally Dry. Flower Color: Pink, White. Flower Bloom Time: Spring. Flower Description: Light pinkish white, pea-like flowers appear in spring. This plant has an extreme flammability rating. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Herbaceous. Growth habit is a single or multiple shooting vine from a crown [1-2].

#### 4.1.26 Desmodium glutinosum

Pointed-leaved Ticktrefoil  
 tf02n 3 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.9 m hkcuc  
 hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli hjonli

drutta Desmodium glutinosum is a PERENNIAL growing to 0.9 m (3ft) by 0.9 m (3ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None Known  
 tcanta Nitrogen Fixer: A member of the Legume Family, it improves the soil by adding nitrogen. Attracts: Butterflies. Larval Host: Eastern Tailed Blue, Silver-spotted Skipper. Invertebrates shelter: beneficial for insects and other arthropods.

dwatta None known  
 propta Seed.

nwatta A perennial wildflower found in part shade, shade; woods, and thickets. Prefers partial sun to medium shade, moist to dry-mesic conditions, and loamy soil with decaying organic matter. Clay-loam and rocky soil are also tolerated. Bloom Time: June to August. Bloom Color: Pink. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

#### 4.1.27 Genista sagittalis

Winged Broom, Arrow Broom  
 tf02n 3 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkcuc

drutta Pinus contorta is an evergreen Tree growing to 15 m (49ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May, and the seeds ripen from January to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Inner bark Sap SeedEdible Uses: Condiment GumInner bark - raw or cooked[2, 94, 105, 161, 257]. It can be used fresh or dried. It is mashed into a pulp and made into cakes then baked[94]. Harvested in early spring, the taste is not unpleasant, and it develops a strong taste of turpentine as the season advances[2]. The inner bark is ready to harvest when the male cones are producing pollen[257]. A famine food, it is only used when all else fails. Sap - collected in spring and used as a drink[161, 177]. Seed - raw or cooked[257]. A gum is made from the pitch obtained from the trunk. It is allowed to harden and used for chewing[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Adhesive Dye Fuel Gum Herbicide Pitch String Waterproofing WoodA tan or green dye is obtained from the needles[168]. The roots have been braided by the N. American Indians to make a rope[226]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. A pitch obtained from this tree is used for waterproofing canoes, baskets, shoes etc and as a glue[64, 99, 226, 257]. It has also been used to preserve wood, baskets etc[257]. The pitch is not a commercially important crop[64]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - straight but coarse-grained, light, hard, strong, brittle[60, 82]. It varies from light and soft to hard and heavy[229]. Easily worked, it is used for general construction, posts, poles, pulp etc[60, 82, 99, 171, 226, 229]. It makes a good fuel, burning well even when green because it is rich in pitch[99, 226].

dwatta Antiseptic Blood purifier Cathartic Diuretic Pectoral Poultice Salve TB Tonic VD VulneryaryBeach pine was widely employed medicinally by several native North American Indian tribes who used it especially for its antiseptic and healing properties on wounds, infections etc, and also for its beneficial effects upon the chest and lungs[257]. It is little, if at all, used in modern herbalism. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient, vermifuge and vulneryary[4, 257]. It is a valuable remedy when taken internally in the treatment of kidney and bladder complaints and can be used both internally and externally in the treatment of rheumatic affections[4, 257]. It is also used in treating diseases of the mucous membranes and respiratory complaints[4, 257]. Externally it is used in the form of liniment plasters and poultices in treating a range of skin complaints, wounds, boils etc[4, 257]. A decoction of the young shoots has been used in the treatment of stomach pains[257]. The young buds have been chewed in the treatment of a sore throat[257]. The inner bark has been eaten as a blood purifier, diuretic and cathartic[257]. A decoction has been used as a tonic and in the treatment of coughs, colds, consumption and gonorrhoea[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and

protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Alpine garden, Screen, Seashore, Specimen, Woodland garden. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Tolerates water-logged soils[81]. Succeeds in exposed maritime positions[49, 81]. Established plants tolerate drought[200]. The coastal form of this species is a very fast growing tree, especially when young, with new growth of 1 metre or more per year[185]. The forms from coastal Washington and Oregon do best in Britain. The subspecies P. contorta latifolia is normally slower growing than the species type though it is sometimes faster in some inland sites at higher altitudes[185]. New growth takes place from mid-April until early July[185]. Trees are long-lived, with specimens 600 years old recorded[229]. Extensively cultivated for timber in N. Europe[50, 200], this is an aggressive colonizing species that can form huge pure stands following a forest fire or clear-felling an area for timber[226]. Trees can be shrubby in habit when they are grown on poor sites[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow below the tree[18]. There are some named forms, selected for their ornamental value[188]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species hybridises in the wild with P. banksiana where their ranges overlap[226]. Trees come into flower at an early age, usually between 1 and 10 years[229]. Good seed crops are produced every 1 - 3 years[229]. The cones are 2 - 5cm long[82], they open and shed their seed whilst still attached to the tree[226], though many of the cones will remain unopened on the tree, preserving the vitality of the seeds until they are stimulated to open by excessively hot weather or a forest fire[82, 229]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native.

#### 2.2.3 Equisetum scirpoides

Dwarf scouring rush  
 1 tlin 9 cyuc 2 kcak 3 tcan 2 dwat 0.2 m hkcuc  
 pcmhmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwssliw hpa7tmwatli hjonli

drutta Equisetum scirpoides is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Root StemEdible Uses: The root tubercles can be eaten raw. Sterile stems are dried, ground to a powder and used for thickening or to make a mush. This powder has also been used to make a tea, and is sold in some grocery stores. Underground stems and roots are eaten raw, with or without lard, and are sometimes put in Indian ice-cream. Underground stems and roots are food to some native American groups. They are collected in the spring by water, and are sweet and juicy then, much relished as the first fruit of the season (flora.dempstercountry.org).

tcanta Groundcover: A medium density moderately good groundcover. The coarse green stems are used to scrub pots and clean dishes. Larger horsetails have the ability to absorb heavy metals from soil and are often used in remediation projects involving heavy metal contaminants. Wildlife

Benefits: Amphibians, Cover, Fish, Food, Nesting, Waterfowl, Containers. Dynamic Accumulator.

dwatta We found no specific reference to this species but in general horsetails have an unusual chemistry compared to most other plants; they are rich in silica, more than 35%, contain several alkaloids (including nicotine) and various minerals. Horsetail is very astringent and makes an excellent clotting agent, staunching wounds, stopping nosebleeds and reducing the coughing up of blood. It helps speed the repair of damaged connective tissue, improving its strength and elasticity. Horsetail provides a naturally occurring source of organic silica. It is therefore a remedy for conditions where there is an inability to absorb and retain silica. When this occurs there are weaknesses in the hard structures of the body. The hair becomes thin, fails to thrive, and fizzles away into split ends. The nails are often weak, breaking easily, with hangnails and lingering infections about the nail. In homeopathy, silica is known as the "homeopathic scalpel," because of its ability to act like a blade, like flint, to cut, to bring matters to the surface and to heal charitably. It cuts in, opens tissues, and releases pus and corrupted material, while cleansing and reincarnating flesh. It has a centripetal effect, removing heavy, unneeded materials to the surface and out.

propta Rhizome sections. Horsetail plants produce the best rhizomes for propagation in the spring. Lengths of these underground stems, typically about 6 inches, with healthy shoots emerging from their joints produce the healthiest new plants.

nwatta A Long-lived perennial evergreen with fibrous roots and the smallest living horsetail. Can be used as an aquatic fern. Light requirement: Sun , Part Shade , Shade. Soil moisture: moist or wet (recommended water depth over crown of plant: 0 - 3cm (0 - 1 inch)). Water quality: pH 5.6-6.5. Useful for winter interest in a small pond, barrel, or tub garden, especially in shady areas. Pond Zone: flood plain - Upland. High marsh - saturated. soil spores shed from July through August, or persisting unopened until the following summer. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Evergreen. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. Not a flowering plant. Reproduces by spores contained within sporangia borne on peltate sporophylls.

## 2.2.4 Ambrosia trifida

Giant Ragweed, Great ragweed, Texan great ragweed, Biterweed, Bloodweed, Buffalo Weed, Horse Cane  
1 tin 11 cyuc 1 kcak 1 tcan 3 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlitnyik hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Ambrosia trifida is a ANNUAL growing to 2 m (6ft 7in) at a medium rate. It is in flower from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilThis plant was cultivated by the pre-Columbian N. American Indians, seeds found in pre-historic sites are 4 - 5 times larger than those of the present-day wild plant, which seems to indicate selective breeding by the Indians[207]. The following report is for *A. artemesifolia*, it quite possibly also applies to this species[K]. An oil is obtained from the seed. It has been suggested for edible purposes because it contains little linolenic acid[61, 183]. The seed contains up to 19% oil[61], it has slightly better drying properties than soya bean oil[183].

tcanta Dye OilA red colour is obtained from the crushed heads[207]. (This probably refers to the seed heads[K]). The sap of the plant can stain the skin red[274]. A positive impact may be seen with a noted decrease in the numbers of plant-parasitic nematodes found in soybean fields where *A. trifida* is present (Wang et al., 1998).

dwatta Antidote Astringent Emetic Poultice Skin Women's complaintsThe leaves are very astringent, emetic and febrifuge[222, 257]. They are applied externally to insect bites and various skin complaints, internally they are used as a tea in the treatment of pneumonia, fevers, nausea, intestinal cramps, diarrhoea and mucous discharges[222]. The juice of wilted leaves is disinfectant and is applied to infected toes[257]. A tea made from the roots is used in the treatment of menstrual disorders and stroke[222]. The pollen is harvested commercially and manufactured into pharmaceutical preparations for the treatment of allergies to the plant[222].

propta Seed - we have no details for this species but suggest sowing the seed in situ in April.

nwatta We have very little information on this species but suggest growing it in a sunny position in a well-drained soil[K]. This plant is sometimes cultivated by the N. American Indians for food and medicine[207]. Special Features: North American native, Invasive, Inconspicuous flowers or blooms.

## 3 2 tlin

### 3.1 bwon

#### 3.1.1 Caragana arborescens

Siberian Pea Tree, Siberian peashrub  
tfo2n 2 tlin 7 cyuc 5 kcak 4 tcan 1 dwat 6 m hkuc  
htut cyutli hgatyuctcup hwicli hyishrasjut hpa7tli flatprik-wisslip hpa7tmwatli xre7t hjonli

drutta Caragana arborescens is a deciduous Shrub growing to 6 m (19ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil Seed SeedpodEdible Uses: OilSeed - cooked[2, 105]. Small but produced in abundance[11], there are 4 - 6 seeds per pod[202]. A bland flavour, it is best used in spicy dishes[183]. The raw seed has a mild pea-like flavour, though we are not sure if it should be eaten in quantity when raw[K]. The seed contains 12.4% of a fatty oil and up to 36% protein[183, 269], it has been recommended as an emergency food for humans[65]. More than just an emergency food, this species has the potential to become a staple crop in areas with continental climates[K]. Young pods - cooked and used as a vegetable[46, 61, 105, 177, 183, 269].

tcanta Companion Dye Fibre Hedge Hedge Oil Shelterbelt Soil stabilizationA fibre obtained from the bark is used for making cordage[46, 61, 74, 269]. A blue dye is obtained from the leaves[74, 269]. The seed contains 12.4% of a fatty oil[74]. The plant can be grown as a hedge[160]. It is quite wind-resistant and can also be planted in a shelterbelt[200]. The plant has an extensive root system and can be used for erosion control, especially on marginal land[160]. Because of its nitrogen-fixing capacity, it is valued as a soil-improving plant[269].

dwatta Cancer EmmenagogueThe whole plant, known as ning tiao, is used in the treatment of cancer of the breast, and the orifice to the womb, and for dysmenorrhoea and other gynaecological problems[269].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in

#### 4.1.21 Alnus serrulata

Smooth Alder, Hazel alder  
tfo2n 3 tlin 9 cyuc 0 kcak 2 tcan 2 dwat 4.5 m hkuc  
htut cyutli tcuphja7n hwicli hysisjutnyikfrip hpa7tli flatprik-wis hpa7tmwatli hjonli

drutta *Alnus serrulata* is a deciduous Shrub growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 3. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known  
tcanta Soil stabilizationTrees have extensive root systems and are sometimes planted on the banks of streams in order to prevent erosion[227]. The wood is soft and brittle, weighing 29lb per cubic foot[227]. It is of little commercial value[229].

dwatta Astringent Diuretic Emetic Ophthalmic PurgativeA tea made from the bark is analgesic, astringent, blood purifier, diuretic, emetic and purgative[4, 222, 257]. It is used in the treatment of diarrhoea, the pain of childbirth, coughs, toothache and sore mouths[222]. Externally, it is used as an eye wash and a wash for hives, poison ivy rash, piles, swellings and sprains[222]. A decoction of the cones is astringent[4].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile soils[200]. Requires a position in full sun, dying out when shaded by taller trees[229]. A fast-growing but short-lived tree[229]. This species is closely related to *A. rugosa*[11]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

#### 4.1.22 Caragana jubata

Shag-Spine  
tfo2n 3 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc  
htut cyutli hgatyuctcup hwicli hyishrasjut hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta *Caragana jubata* is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained

soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known  
tcanta Fibre Hedge HedgeA fibre obtained from the bark is used for making cordage, gunny bags etc[91]. A very spiny plant, it forms an impenetrable barrier and can be grown as a hedge[200].

dwatta Antirheumatic Demulcent VulneraryAntirheumatic, demulcent, vulnerary. Used in the treatment of boils, swellings, coughs, headaches and rheumatic arthritis[91].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Prefers full sun and a light sandy dry or well-drained soil[1, 11, 200]. Dislikes damp conditions[1]. Does not require a rich soil, succeeding on marginal land[11]. A very hardy plant but it does not like the lack of sun in British gardens. It is best grown at the foot of a warm dry wall in a well-drained light soil[11]. It prefers a continental climate with hot summers and cold winters[200], it does not flower freely in Britain due to our cooler summers and lack of sunshine[182]. A remarkably curious shrub, but it is not showy[1]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

#### 4.1.23 Baptisia australis

Wild Indigo, Blue wild indigo, Blue False Indigo  
tfo2n 3 tlin 9 cyuc 0 kcak 2 tcan 2 dwat 1.5 m hkuc  
htut cyutli kyuctcup hwicli hrasjut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Baptisia australis* is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from May to October, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta A blue dye is obtained from the plant[257]. No more information is given, but it is likely to be the leaves that are used[K].

dwatta Antiemetic Appetizer Digestive Emetic PurgativeAppetizer, digestive[61]. The root is antiemetic, emetic and purgative[222, 257]. There are confusing reports from two sources that the plant is used as an emetic and also that a cold tea is given to stop vomiting[222, 257]. A poultice of the root is anti-inflammatory and is held in the mouth to treat toothaches[222]. The plant is under investigation as a potential stimulant of the immune system[222].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed should be pre-soaked for 24 hours in warm water and then sown in a cold frame in late winter or early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer or following spring. Division in spring[188]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Seashore. Prefers a deep, well-drained neutral to

nwatta Agroforestry Services: Nitrogen Industrial Crop: Biomass Industrial Crop: Tannin Management: Coppice Management: Standard Minor Global Crop Other Systems: SRCLandscape Uses: Firewood, Pest tolerant, Pollard, Screen. Prefers a heavy soil and a damp situation[1, 11], tolerating prolonged submergence of its roots and periods with standing water to 30cm deep[186, 200]. Plants can also grow quickly in much drier sites, though they will usually not live for so long in such a position. Alders grow well in heavy clay soils[24, 98], they also tolerate lime and very infertile sites[200]. Tolerates a wide range of soils but prefers a pH above 6[186]. Very tolerant of maritime exposure[49, 75, 166]. Alder is estimated to tolerate an annual precipitation of 40 to 200cm, an annual average temperature of 8 to 14°C and a pH of 6 to 8[269]. The leaves often remain green on the tree until November, or even later on young seedlings. The seeds contain a margin of air-filled tissue and are capable of floating in water for 30 days before becoming waterlogged[186]. This enables distribution of the seed by water. The alder has a very rapid early growth[98], specimens 5 years old from seed were 4 metres tall even though growing in a very windy site in Cornwall[K]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[98, 200]. Nitrogen-fixation by trees up to 8 years old has been put at 125 kg/ha/yr. for 20 years at 56 - 130 kg/ha/yr.[269]. Trees often produce adventitious roots from near the base of the stem and these give additional support in unstable soils[186]. Trees are very tolerant of cutting and were at one time much coppiced for their wood which had a variety of uses[4, 186]. Alders are an important food plant for the caterpillars of many butterfly and moth species[30] and also for small birds in winter[24]. There are 90 insect species associated with this tree[24]. There are some named varieties, selected for their ornamental value[200]. Special Features: Not North American native, Naturalizing, Wetlands plant, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 4.1.19 Alnus hirsuta

tfo2n 3 tlin 7 cyuc 0 kcaak 0 tcan 0 dwat 18 m hkuac hmimhtut cyutli tucphja7n hwicli hysiljutnykfrp hpa7tli flat-prikhwis hpa7tmwatli hjonli

drutta Alnus hirsuta is a deciduous Tree growing to 18 m (59ft 1in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from March to April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known  
tcanta Charcoal Dye WoodA dye is obtained from the bark[46, 61]. No more details are given. Wood - close grained. Used in turnery and for making charcoal[46, 61].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. A polymorphic species[58], it is closely related to *A. incana*[11]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 4.1.20 Robinia viscosa

Clammy Locust, Hartweg's locust  
tfo2n 3 tlin 7 cyuc 0 kcaak 3 tcan 0 dwat 13 m hkuac hmimhtut cyutli hgatkuyctucp hwicli hyishrasjlutnyk hpa7tli flat-prikhwis hpa7tmwatli xre7t hjonli

drutta Robinia viscosa is a deciduous Tree growing to 13 m (42ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Soil stabilizationPlants produce an extensive suckering root system and can be used for soil stabilization on banks etc[229]. The flowers are a rich source of nectar for bees. Wood - heavy, hard, close-grained[82]. The wood weighs 50lb per cubic foot[235].

dwatta None known  
propta Seed - pre-soak for 48 hours in warm water and sow the seed in late winter in a cold frame[80]. A short stratification improves germination rates and time[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them out in the greenhouse for their first winter. Plant them out into their permanent positions in the following summer. The seed stores for over 10 years[113]. Suckers taken during the dormant season.

nwatta Succeeds in any soil, preferring one that is not too rich[1, 200]. Requires a well-drained soil, succeeding on dry barren sites[184, 200]. Plants are tolerant of drought and atmospheric pollution[200]. Plants prefer a position in full sun, though they also tolerate light shade. A very hardy plant, tolerating temperatures down to at least -25°C when fully dormant[184]. A fast-growing but short-lived species in the wild[229]. The branches are brittle and very liable to wind damage[200]. When plants are grown in rich soils they produce coarse and rank growth which is even more liable to wind damage[11, 200]. Any pruning should be done in late summer in order to reduce the risk of bleeding[200]. The young branches, seedpods and petioles are covered with dark glandular hairs that exude a clammy sticky substance[82]. Plants sucker freely, especially after coppicing, the suckers have vicious thorns. A very greedy tree, tending to impoverish the soil. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

late spring or early summer, after the last expected frosts. There are approximately 40,000 seeds per kilo[269]. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Agroforestry Services: Living fence Agroforestry Services: Nitrogen Agroforestry Services: Wind-break Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Staple Crop: ProteinSucceeds in most well-drained soils, preferring full sun and a light sandy dry or well-drained soil[1, 11, 200]. Tolerates very alkaline soils[202]. Plants do not require a rich soil[1, 11, 108], succeeding on marginal land[160]. Established plants are drought resistant[160]. Fast growing[188]. Dormant plants are hardy to about -30°C[184], they prefer a continental climate and do not grow so well in areas that do not have very cold winters[200]. They grow and fruit very well in the eastern half of the country, even in northern areas, though they do not do so well in the wetter west[K]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The Siberian pea shrub has an excellent potential to become a staple food crop. The seed is nutritious and wholesome, although rather small it is often very freely borne and is easily harvested[K]. This species has also been recommended as a nitrogen-fixing windbreak and ground cover plant that binds the soil and produces fibre and dye stuffs[218]. *C. boissii* and *C. fruticosa* are closely related to this species[182] and can probably be used similarly[K]. A very ornamental plant, some named forms have been developed for their ornamental value[182]. 'Nana' is a very compact dwarf form[183] that grows slowly[11]. 'Pendula' has stiffly pendent branches but is otherwise the same as the type species[11]. A good bee plant[74]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 3.1.2 Phaseolus vulgaris

French Bean, Kidney bean  
tfo2n 2 tlin 11 cyuc 5 kcaak 2 tcan 2 dwat 2 m hkuac htut cyutli tucp hwicli hrasjlutnyk hpa7tli prikhwis hpa7tmwatli fyixre7t hjonli

drutta Phaseolus vulgaris is an ANNUAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in leaf from May to October, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Seed SeedpodEdible Uses: Coffee Coffee CondimentImmature seedpods - raw or cooked[46, 105]. The green pods are commonly used as a vegetable, they have a mild flavour and should only be cooked for a short time. When growing the plant for its seedpods, be sure to pick them whilst they are still small and tender. This will ensure the continued production of more pods by the plant. Flowering is reduced once the seeds begin to form inside the pods. The immature seeds are boiled or steamed and used as a vegetable[183]. The mature seeds are dried and

stored for future use. They must be thoroughly cooked before being eaten and are best soaked in water for about 12 hours prior to this. They can be boiled, baked, pureed, ground into a powder or fermented into 'tempeh' etc[183]. The powdered seed makes a protein-enriching additive to flour, it can also be used in soups etc[K]. The seed can also be sprouted and used in salads or cooked[183]. The roasted seeds have been used as a coffee substitute[7]. Young leaves - raw or cooked as a potherb[177, 183]. The very young leaves are sometimes eaten as a salad, the older leaves are cooked[269].

tcanta Biomass Dye Fungicide MiscellanyA brown dye is obtained from red kidney beans[168]. The plant contains phaseolin, which has fungicidal activity[218]. Water from the cooked beans is very effective in reviving woollen fabrics[7]. The plant residue remaining after harvesting the dried beans is a source of biomass[269].

dwatta Antiarthritic Antirheumatic Antitussive Cancer Diuretic Homeopathy Hypoglycaemic Hypotensive Miscellany Narcotic Narcotic UrinaryThe green pods are mildly diuretic and contain a substance that reduces the blood sugar level[218]. The dried mature pod is used according to another report[9]. It is used in the treatment of diabetes[9]. The seed is diuretic, hypoglycaemic and hypotensive[7]. Ground into a flour, it is used externally in the treatment of ulcers[7]. The seed is also used in the treatment of cancer of the blood[218]. When bruised and boiled with garlic they have cured intractable coughs[4]. The root is dangerously narcotic[4]. A homeopathic remedy is made from the entire fresh herb[9]. It is used in the treatment of rheumatism and arthritis, plus disorders of the urinary tract[9].

propta Pre-soak the seed for 12 hours in warm water and sow in mid spring in a greenhouse. Germination should take place within 10 days. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts. The seed can also be sown in situ in late spring though it may not ripen its seed in a cool summer.

nwatta Requires a warm sunny position in a rich well-drained preferably light soil with plenty of moisture in the growing season[27, 37, 200]. Dislikes heavy, wet or acid soils[16, 37]. Prefers a pH in the range 5.5 to 6.5[200]. The French bean is commonly cultivated in the temperate and subtropical zones and in montane valleys of the tropics for its edible mature seeds and immature seedpods. It is often grown to provide a major part of the protein requirement[183, 269]. A very variable plant, there are more than 1,000 named varieties ranging from dwarf forms about 30cm tall to climbing forms up to 3 metres tall[183, 186, 200, 269]. Plants are not frost-tolerant, air temperatures below 10°C can cause damage to seedlings[200]. When grown for their edible pods, the immature pods should be harvested regularly in order to promote extra flower production and therefore higher yields[200]. Yields of green pods averages about 3kg per square metre, though double this can be achieved[200]. French beans grow well with strawberries, carrots, cauliflowers, cucumbers, cabbage, beet, leek and celeriac[18, 20]. They are inhibited by alliums and fennel growing nearby[18, 20]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

### 3.1.3 Elaeagnus angustifolia

Oleaster, Russian olive  
tfo2n 2 tlin 7 cyuc 4 kcaak 4 tcan 2 dwat 7 m hkuac htut cyutli hgatkuyctucp hwicli hyishrasjlutnyk hpa7tli flat-prikhwisiphosom hpa7tmwatli xre7t hjonli

drutta Elaeagnus angustifolia is a deciduous Shrub growing to 7 m (23ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral

and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckakta Edible Parts: Fruit SeedEdible Uses: GumFruit - raw or cooked as a seasoning in soups[1, 2, 3, 100, 146, 74]. Dry, sweet and mealy[11, 145, 183]. The fruit can also be made into jellies or sherbets[183]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The oval fruit is about 10mm long[200] and contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

tcanta Companion Essential Fodder Fuel Gum Hedge Hedge WoodPlants can be grown as a hedge in exposed positions[29], tolerating maritime exposure[200]. It is fairly fast-growing and very tolerant of pruning, but is rather open in habit and does not form a dense screen[K]. Because the plant fixes atmospheric nitrogen, it makes a hedge that enriches the soil rather than depriving it of nutrients[K]. An essential oil obtained from the flowers is used in perfumery[74]. A gum from the plant is used in the textile industry in calico printing[74]. Wood - hard, fine-grained. Used for posts, beams, domestic items[74, 100], it is also much used for carving[245]. The wood is an excellent fuel[74, 146].

dwatta Cancer Febrifuge PectoralThe oil from the seeds is used with syrup as an electrolyte in the treatment of catarrh and bronchial affections[240]. The juice of the flowers has been used in the treatment of malignant fevers[240]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Difficult[113]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, October/November in a frame[200]. The cuttings are rather slow and difficult to root, leave them for 12 months[113]. Layering in September/October. Takes 12 months[78]. Root cuttings in the winter[200].

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Coppice Management: Standard Minor Global CropLandscape Uses:Screen, Specimen. An easily grown plant, it succeeds in most soils that are well-drained[200], though it dislikes shallow chalk soils[98]. Prefers a light sandy soil that is only moderately fertile[11], succeeding in poor soils and dry soils[11, 200]. Requires a position in full sun, growing very well in hot dry positions[182]. Plants are very drought and wind resistant[1, 166, 200], they tolerate conditions of considerable salinity and alkalinity[227]. A very hardy plant, tolerating temperatures down to about -40°C[184]. However, plants prefer a continental climate[49] and are apt to be cut back in severe winters in Britain because the summer is often not warm enough to have fully ripened the wood[1]. A very variable species[214]. This species is often cultivated in N. Europe for its edible fruits, there are many named varieties and some of these are thornless[214]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[160, 200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Plants are very tolerant of pruning, they usually resprout freely even when cut right back to the ground. This species is notably resistant to honey fungus[88, 200]. The flowers are sweetly and heavily scented[184]. Special Features: Attractive foliage, Not North American

native, Invasive, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 3.1.4 Caragana boisii

Siberian peatree  
tfo2n 2 tlin 9 cyuc 4 kcak 4 tcan 0 dwat 2 m hkuc  
htu2t cyutili hgatkuyctcup hwicli hychrsajlut hpa7ti flatprikli-wissliip hpa7tmwatli xre7t hjonli

drutta Caragana boisii is a deciduous Shrub growing to 2 m (6ft) by 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: Oil Seed SeedpodEdible Uses: OilThe following uses are for the closely related *C. arborescens* and can probably also be applied to this species[K]. Seed - cooked[2, 105]. Small but produced in abundance[11], there are 4 - 6 seeds per pod[202]. A bland flavour, it is best used in spicy dishes[183]. The raw seed has a mild pea-like flavour, though we are not sure if it should be eaten in quantity when raw[K]. The seed contains 12.4% of a fatty oil and up to 36% protein[183], it has been recommended as an emergency food for humans[65]. Young pods - cooked and used as a vegetable[46, 61, 105, 177, 183].

tcanta Dye Fibre Hedge Hedge Oil Shelterbelt Soil stabilizationThe following uses are for the closely related *C. arborescens* and can probably also be applied to this species[K]. A fibre is obtained from the bark, used for cordage[46, 61, 74]. A blue dye is obtained from the leaves[74]. The seed contains 12.4% of a fatty oil[74]. The plant can be grown as a hedge[160]. It is quite wind-resistant and can also be planted in a shelterbelt[200]. The plant has an extensive root system and can be used for erosion control, especially on marginal land[160].

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Succeeds in most well-drained soils, preferring full sun and a light sandy dry or well-drained soil[1, 11, 200]. Tolerates very alkaline soils[202]. Does not require a rich soil[1, 11, 108], succeeding on marginal land[160]. Established plants are drought resistant[160]. Fast growing[188]. This species is hardy to at least -30°C[184], it prefers a continental climate with hot summers and cold winters so it does not grow so well in the milder western half of Britain[200]. This species is closely related to *C. arborescens*, differing in the longer teeth of the calyx and in the downy ovary and

female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

ckakta Edible Parts: SeedpodEdible Uses: The young seedpods are 'nibbled'[177]. Caution is advised, see notes above on toxicity.

tcanta Dye Green manureAn orange-yellow dye is obtained from the flowers[74]. A useful green manure plant, fixing atmospheric nitrogen[7]. It is difficult to see this plant as a useful green manure, it is fairly slow growing with us and does not produce much bulk[K].

dwatta Antiinflammatory Antispasmodic Cardiotonic Carminative Febrifuge Hypoglycaemic Restorative Sedative Tonic VermifugeCarminative, febrifuge, hypoglycaemic, restorative, vermifuge[178]. The flowers are antispasmodic, cardiotonic and sedative[7]. The root is carminative, febrifuge, restorative and tonic[218]. The plant is used externally as a local anti-inflammatory compress in all cases of skin inflammation[7].

propta Pre-soak the seed for 24 hours in warm water and then sow in the spring or autumn in situ. The seed usually germinates in 2 - 4 weeks at 15°C. If seed is in short supply, it can be sown in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring or early summer.

nwatta Landscape Uses:Border, Erosion control, Rock garden. Requires a well-drained soil in a sunny position[200]. Dislikes shade[200]. Does well on poor soils[61]. An important food plant for many caterpillars[30]. It is also a good bee plant[74], the flowers providing an important source of nectar[240]. The flowers are powerfully scented, even though they are able to pollinate themselves[245]. The plant spreads very freely at the roots[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attracts butterflies. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

### 4.1.18 Alnus glutinosa

Alder, European alder - Common Alder, Black Alder  
tfo2n 3 tlin 7 cyuc 0 kcak 5 tcan 3 dwat 25 m hkuc  
hmimhtut cyuti tcluphja7n hwicli hysislutnyikfrkip hpa7ti flatprikliw hpa7tmwatli hjonli

drutta Alnus glutinosa is a deciduous Tree growing to 25 m (82ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from March to November, in flower from March to April, and the seeds ripen from September to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

ckakta None known

tcanta Charcoal Dye Hedge Hedge Ink Insecticide Parasiticide Pioneer Shelterbelt Soil reclamation Tannin Teeth WoodTolerant of clipping and maritime exposure, the alder can be grown in a windbreak or a hedge[75]. The trees are very quick to establish[200] and will grow at a rate of 1 metre or more per year when young[K]. This is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also

makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. Because they tolerate very poor soils and also produce nitrogen nodules on their roots, alders are suitable for use in land reclamation schemes. The plants can be used as a source of biomass[269]. According to the phytomass files, annual productivity is estimated at 6 to 9 tonnes per hectare. The tree has yielded 11.8 tonnes per hectare per annum on pulverized fuel ash and annual productivity has been estimated at 8.66 tonnes per hectare, with 5.87 tonnes in wood, bark, and branches, 2.79 tonnes in foliage[269]. Alder has been recommended for consideration for firewood plantations in Tropical highlands where unseasonable cold might destroy the red alder[269]. The powdered bark has been used as an ingredient of toothpastes[9]. Sticks of the bark have been chewed as tooth cleaners[9]. An ink and a tawny-red dye are obtained from the bark[4, 6, 7, 66]. A green dye is obtained from the catkins[4, 6, 66]. A pinkish-fawn dye is obtained from the fresh green wood[4, 6, 66]. A yellow dye is obtained from the bark and young shoots[4, 6, 66]. A cinnamon dye is obtained from the shoots if they are harvested in March[4]. If they are dried and powdered then the colour will be a tawny shade[4]. The bark and the fruits contain up to 20% tannin[46, 61, 223], but they also contain so much dyestuff (imparting a dark red shade) that this limits their usefulness[4, 7]. The leaves are also a good source of tannin[4]. The leaves are clammy and, if spread in a room, are said to catch fleas and flies on their glutinous surface[4, 7]. Wood - very durable in water, elastic, soft, fairly light, easily worked, easily split. It is often used for situations where it has to remain underwater and is also used for furniture, pencils, bowls, woodcuts, clogs etc. It is much valued by cabinet makers[4, 7, 11, 13, 26, 46, 66, 100, 115]. The wood also makes a good charcoal[4, 115].

dwatta Alterative Astringent Cathartic Emetic Febrifuge Galactogogue Haemostatic Parasiticide Skin Tonic VermifugeThe bark is alterative, astringent, cathartic, febrifuge and tonic[4, 7, 14, 46, 269]. The fresh bark will cause vomiting, so use dried bark for all but emetic purposes[21]. A decoction of the dried bark is used to bathe swellings and inflammations, especially of the mouth and throat[4, 9, 21, 254]. The powdered bark and the leaves have been used as an internal astringent and tonic, whilst the bark has also been used as an internal and external haemostatic against haemorrhage[21]. The dried bark of young twigs are used, or the inner bark of branches 2 - 3 years old[9]. It is harvested in the spring and dried for later use[9]. Boiling the inner bark in vinegar produces a useful wash to treat lice and a range of skin problems such as scabies and scabs[21]. The liquid can also be used as a toothwash[21]. The leaves are astringent, galactogogue and vermifuge[7]. They are used to help reduce breast engorgement in nursing mothers[254]. A decoction of the leaves is used in folk remedies for treating cancer of the breast, duodenum, oesophagus, face, pylorus, pancreas, rectum, throat, tongue, and uterus[269]. The leaves are harvested in the summer and used fresh[238].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. There are about 700,000 - 750,000 seeds per kilo, but on average only about 20 - 25,000 plantable seedlings are produced[269]. Seeds can remain viable for at least 12 months after floating in water[269]. Seeds germinate as air-dried seeds stored at 1 - 2°C retained their viability for two years. Seeds can however be sown immediately as soon as ripe[269]. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.



drutta *Trifolium incarnatum* is a ANNUAL growing to 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: TeaThe seeds can be sprouted and eaten in salads[183]. They can also be dried and ground into a nutritious flour[183]. Dried flower heads are a tea substitute[183].

tcanta Green manure Soil reclamationUsed as a green manure. It is relatively fast growing, makes an excellent weed suppressing cover and fixes nitrogen[1, 46, 61, 87]. It is also used with grass seed mixes in soil reclamation projects[200].

dwatta None known  
propta Pre-soak the seed for 12 hours in warm water and then sow in spring to early summer in situ. The seed can also be sown in early autumn as a winter green manure.

nwatta Succeeds in a moist, well-drained circum-neutral soil in full sun[200]. Succeeds in poor soils. The ssp. *molinierli* is the form of this species that is native to Britain, whilst ssp. *incarnatum* is naturalized in S. Britain and is the form grown as a green manure crop[17]. It grows well in an apple orchard, the trees will produce tastier fruit that stores better[201]. It should not be grown with camellias or gooseberries because it harbours a mite that can cause fruit drop in the gooseberries and premature budding in the camellias[201]. Fairly resistant to 'clover rot'[87]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Buttercups growing nearby depress the growth of the nitrogen bacteria by means of a root exudate[201]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

### 4.1.15 Caragana pygmaea

Pygmy Peashrub  
tfo2n 3 tin 7 cyuc 1 kca 2 tcan 0 dwat 1.2 m hkuc htuc cyutli hgatyuctcup hwicli hyishrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Caragana pygmaea* is a deciduous Shrub growing to 1.2 m (4ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: RootEdible Uses: Root - cooked[105]. An emergency food, used when all else fails[177].

tcanta Fuel StringThe shoots are very flexible, they are used like string for tying[11]. The wood is used for fuel[146].  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cut-

tings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Landscape Uses:Border, Container, Specimen. Prefers full sun and a light sandy dry or very well-drained soil[1, 11, 200]. Does not require a rich soil, succeeding on marginal land[1, 11]. Tolerant of dry alkaline soils. A very ornamental plant[1], it prefers a continental climate with hot summers and cold winters, it does not grow so well in mild maritime areas such as the western half of Britain. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 4.1.16 Lathyrus ornatus

Bush Vetchling  
tfo2n 3 tin 7 cyuc 1 kca 0 tcan 1 dwat 0.3 m hkuc htuc cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lathyrus ornatus* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedpodEdible Uses: Seedpods - cooked[46, 61, 105, 161].

tcanta DisinfectantNone known  
dwatta Birthing aid DisinfectantThe plant has been used to help remove the placenta after child birth[257]. The plant has disinfectant properties, a cold infusion has been used internally and as a wash in the treatment of 'deer infection'[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta An easily grown plant, succeeding in any moderately good garden soil but preferring a position in full sun[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 4.1.17 Lotus corniculatus

Bird's Foot Trefoil  
tfo2n 3 tin 8 cyuc 1 kca 4 tcan 1 dwat 0.3 m hkuc htuc cyutli kyuctcup hwicli hyishrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifre7t hjonli

drutta *Lotus corniculatus* is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and

young fruit[11]. It can probably be used in all the ways *C. arborescens* is used and therefore has an excellent potential for human food.[K]. A good bee plant[74]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 3.1.5 Myrica pensylvanica

Northern Bayberry  
tfo2n 2 tin 9 cyuc 3 kca 3 tcan 1 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli frusflatprikhsom hpa7tmwatli hjonli

drutta *Myrica pensylvanica* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: CondimentFruit - raw or cooked. The fruit is about 4mm in diameter and contains a single large seed[200]. There is very little edible flesh and this is of poor quality[K]. The leaves and fruit are used as a food flavouring in soups etc[62, 102, 183]. A bay leaf substitute, imparting a delicate aroma and subtle flavour[183]. The herb is removed before the food is served[183].

tcanta Dye Hedge Hedge WaxA wax covering on the fruit is extracted by scalding the fruit with boiling water and immersing them for a few minutes, the wax floats to the surface and is then skimmed off. The fruit is then boiled in water to extract the wax from the pulp and once more the wax is skimmed off. It is then strained through a muslin cloth and can be used to make aromatic candles[46, 106, 171]. Candles made from this wax are quite brittle but are less greasy in warm weather[213]. They are slightly aromatic, with a pleasant balsamic odour[245], and do not smoke when put out, making them much more pleasant to use than wax or tallow candles[213]. The wax is also used in making soaps[213]. A green dye is obtained from the leaves[106]. The plant is very wind hardy and can be grown as an informal hedge[200]. Carbon farming - Industrial Crop: wax. Agroforestry Services: nitrogen.

dwatta The root bark is astringent and emetic in large doses[222]. A tea made from the leaves is used in the treatment of fevers and externally as a wash for itchy skin[222].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Barely cover the seed and keep it moist. Stored seed germinates more freely if given a 3 month cold stratification and then sown in a cold frame. Germination is usually good[78]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in the cold frame for the first winter. Plant out in late spring or early summer[K]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Pot up and overwinter in a cold frame. Fair to good percentage[78]. Cuttings of mature wood in November/December in a frame. Layering in spring[200]. Division of suckers in the dormant season. Plant them out direct into their permanent positions.

nwatta Agroforestry Services: Nitrogen Industrial Crop: Wax Management: Standard Regional CropIt is a temperate plant. Prefers a moist soil. Grows well in an open position in a well-drained soil in sun or light shade[200]. Thrives in any ordinary garden soil[11]. Prefers a lime-free loamy or peaty soil[1]. Does well in dry maritime sites[200]. Hardy to about -40°C[200]. Closely related to *M. cerifera* and perhaps no more than a harder northern form of it[11], it has larger fruits than *M. cerifera*[182]. Where their ranges overlap, *Myrica pensylvanica* hybridizes quite readily with both *M. cerifera* and *M. heterophylla*[270]. Tolerant of salt spread on roads[200]. Plants in this genus are notably resistant to honey fungus[200]. Many species in this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing

plant but some can also be used by other plants growing nearby[200]. Carbon Farming - Climate: cold to warm temperate. Humidity: humid. Cultivation: regional crop. Management: standard. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 3.1.6 Elaeagnus commutata

Silverberry  
tfo2n 2 tin 6 cyuc 3 kca 4 tcan 2 dwat 3 m hkuc htuc cyutli hgatyuctcup hwicli hyishrasljutnyik hpa7tli flatprikliwssip hpa7tmwatli xre7t hjonli

drutta *Elaeagnus commutata* is a deciduous Shrub growing to 3 m (9ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in May, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[1, 2, 3, 43, 106]. Dry and mealy[11, 95, 172, 183]. Good when added to soups they also make an excellent jelly[183]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The fruit contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

tcanta Bedas Companion Fibre Hedge Hedge Soap-Plants can be grown as a hedge in exposed positions, tolerating maritime exposure. They have a rather open habit, however, and so do not afford a lot of wind protection. Because they fix atmospheric nitrogen, they enrich the soil and so make a very good companion hedge in orchards etc[K]. The fibrous bark is used in weaving, it has been twisted to make strong ropes and has also been used to make blankets and clothing[99, 257]. Dried fruits are used as beads[99, 257]. The berries have been used to make a soap[257].

dwatta Cancer Salve VDA strong decoction of the bark, mixed with oil, has been used as a salve for children with frostbite[257]. A decoction of the roots, combined with sumac roots (*Rhus* spp.), has been used in the treatment of syphilis[257]. This medicine was considered to be very poisonous and, if you survived it, you were likely to become sterile[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant

out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, October/November in a frame[200]. The cuttings are rather slow and difficult to root, leave them for 12 months[113]. Layering in September/October. Takes 12 months[78]. Division of suckers during the dormant season[3, 11]. The larger suckers can be planted out direct into their permanent positions, but it is probably best to pot up smaller suckers and grow them on in a cold frame until they are established.

nwatta An easily grown plant, it succeeds in most soils that are well-drained[200], though it dislikes shallow chalk soils[98]. This last report conflicts rather with the record of its natural habitat, it should grow well on chalk[K]. Prefers a light sandy soil that is only moderately fertile, succeeding in poor and dry soils[11, 200]. Requires a position in full sun[11, 200]. Plants are very drought and wind resistant[1, 11, 200]. A very hardy plant, tolerating temperatures down to about -40°C[184]. However, plants prefer a continental climate and are liable to be cut back in severe winters in Britain mainly because the wood is not fully ripened in our cooler summers. A moderately fast-growing plant[202]. The small flowers are deliciously scented[245]. This species does not normally require pruning but the plant can regenerate from very old wood and so can be cut back severely if required[202]. Plants resent root disturbance and should be placed in their permanent positions as soon as possible[202]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Often confused with *E. angustifolia* even though it is very distinct[50]. Plants produce suckers quite freely, often sending them up at some distance from the plant[182, K]. This species is notably resistant to honey fungus[88, 200]. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 3.1.7 Myrica gale

Bog Myrtle, Sweetgale  
tfo2n 2 tlin 9 cyuc 2 kcaak 4 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli nyanhjloni

drutta *Myrica gale* is a deciduous Shrub growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 1. It is in flower from March to May, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FruitEdible Uses: Conditment TeaThe aromatic fruits and leaves are used either fresh or dried to flavour soups, stews etc[2, 4, 62, 100, 183]. They are sometimes put in beer and ale to improve the flavour and increase foaming[183]. The fruit is about 3mm

in diameter with a single large seed[200]. The dried leaves make a delicate and palatable tea[4, 62, 172, 183].

tcanta Dye Essential Parasiticide Repellent Tannin WaxA wax covering on the fruit and leaves is extracted by scalding the fruit with boiling water and immersing them for a few minutes, the wax floats to the surface and is then skimmed off. The fruit is then boiled in water to extract the wax from the pulp and once more the wax is skimmed off. It is then strained through a muslin cloth and can be used to make aromatic candles[4, 6, 245]. These candles diffuse a delightful odour when burnt[245]. Unfortunately this species does not produce enough wax to make it commercially viable[115]. A yellow dye is obtained from the stem tips[66, 115, 172]. Brown according to another report[257]. A yellow dye is obtained from the seeds[257]. The bark contains tannin and can be gathered in the autumn and used as a yellow dye[4]. The plant repels moths and insects in general[66, 106, 115]. The fragrant leaves are used[4, 100]. A strong detection of the leaves can be used as a parasiticide to kill external body parasites[172]. A fragrant essential oil is obtained from the fruits[115]. Nitrogen Fixer.

dwatta Abortifacient Antipruritic Aromatic Astringent Emmenagogue Parasiticide StomachicThe leaves are abortifacient, aromatic, astringent, emmenagogue and stomachic[4, 46, 172, 238]. The leaves are normally used as a tea, but they do contain a poisonous aromatic oil, so some caution is advised in their use[4].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Barely cover the seed and keep it moist. Stored seed germinates more freely if given a 3 month cold stratification and then sown in a cold frame. Germination is usually good[78]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in the cold frame for the first winter. Plant out in late spring or early summer[K]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Pot up and overwinter in a cold frame. Fair to good percentage[78]. Cuttings of mature wood in November/December in a frame. Layering in spring[200]. Division of suckers in the dormant season. Plant them out direct into their permanent positions.

nwatta There is some difference of opinion about the needs of this plant. Most reports say that it prefers a moist soil and that it grows well in an open position in a well-drained soil in sun or light shade. Most reports also say that it prefers or even requires a lime-free loamy or peaty soil[1, 200] but another report says that it succeeds in any ordinary garden soil[11]. In the wild it is usually found in soils with a pH between 3.5 and 6, but it is also sometimes found in fens with a pH as high as 7.5[186]. A suckering shrub, when well sited it can form thickets[186]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. This habit also allows the plant to succeed in water-logged soils[186]. Dioecious. Male and female plants must be grown if seed is required. This plant is occasionally monoecious and also can change sex from year to year[50]. Flowers are produced mainly on one-year old wood[4]. All parts of the plant are pleasantly aromatic[186]. A good food plant for the caterpillars of many species of butterflies[30]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

what intolerant of root disturbance and should be planted out into its permanent position whilst small[238]. Suckering freely[184], this plant is well suited to clothing banks on soils of low fertility[200]. It has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:North American native. Fragrant foliage, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 4.1.11 Lathyrus japonicus maritimus

Beach Pea  
tfo2n 3 tlin 7 cyuc 2 kcaak 3 tcan 0 dwat m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lathyrus japonicus maritimus* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves Seed SeedpodEdible Uses: CoffeeThe immature seeds are eaten raw or cooked like peas[183, 257]. Mature seeds are cooked or sprouted and used in salads[183]. A delightful vegetable[172]. A famine food[177]. Very bitter[2, 105, 106]. Some caution is advised, see the notes above on toxicity. Young seedpods - raw or cooked when less than 25mm long[105, 106, 183]. A sweet flavour[106, 172]. Young plant - raw or cooked[161]. Use young shoots that are less than 25cm long[172, 213]. The roasted seed is a coffee substitute[61, 183, 257].

tcanta Nitrogen Fixer.  
dwatta None known  
propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta An easily grown plant, succeeding in any moderately good garden soil[1]. Prefers a deep moist well-drained soil in a cool position[187]. Prefers a position in full sun, growing well on hot sunny banks[200]. The seed remains viable for 4 - 5 years in sea water[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is herbaceous. The plant growth habit is a suckering vine sending up suckers some distance main plant [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length

[1-2].

### 4.1.12 Hedysarum vicioides

tfo2n 3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.7 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Hedysarum vicioides* is a PERENNIAL growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw, cooked or dried and ground into a powder[74].

tcanta None known  
dwatta None known  
propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil in a sunny position, preferring a deep well-drained sandy loam[1, 200]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 4.1.13 Lathyrus japonicus

Beach Pea, Smallflower beach pea  
tfo2n 3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lathyrus japonicus* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young plant - raw or cooked. An excellent sustenance[207].

tcanta None known  
dwatta None known  
propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta An easily grown plant, succeeding in any moderately good garden soil[1]. It prefers a deep moist well-drained soil in a cool position[187]. Prefers a position in full sun, growing well on hot sunny banks[200]. The seed remains viable for 4 - 5 years in sea water[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 4.1.14 Trifolium incarnatum

Crimson Clover  
tfo2n 3 tlin 9 cyuc 2 kcaak 4 tcan 0 dwat 0.5 m hkuc  
htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli



above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 4.1.9 *Gymnocladus dioica*

Kentucky Coffee Tree

tfo2n 3 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 20 m hkuc hmitmht cyutli hgatkyuctcup hwicli hyishrasljut hpa7tli flat-prikliwssilphsom hpa7tmwatli nyanhjen hjonli

drutta *Gymnocladus dioica* is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: Seed SeedpodEdible Uses: CoffeeSeedpod - raw or cooked. The roasted seeds can be eaten like sweet chestnuts[257]. The pulp is sweet[2, 82]. A flavour like caramel[222]. The pods are up to 25cm long and 5cm wide[229]. The roasted seed is a caffeine-free coffee substitute[2, 11, 46, 95, 213]. A bitter flavour[226]. Thorough roasting for at least 3 hours at 150°C is necessary in order to destroy the poisonous hydrocyanic acid that is found in the seed[183]. Seed - roasted and eaten like a nut[161, 213, 226]. The seed contains toxic substances, see notes above.

tcanta Insecticide Miscellany Soap Soil reclamation WoodThe fruit is high in saponins and is used as a soap[200]. The leaves are used as a fly poison[222]. Trees are planted on the spoil tips of mines to stabilize and reclaim the soil[200]. Wood - coarse-grained, heavy though not hard, strong, very durable in contact with the soil, finishes to a fine lustre. A handsome wood, it weighs 43lb per cubic foot and is used for cabinet work, furniture, construction, fencing etc[46, 61, 82, 171, 229, 235].

dwatta Homeopathy MiscellanyThe pulverised root bark is used as an effective enema[213, 222, 257]. A tea made from the bark is diuretic[222]. It is used in the treatment of coughs due to inflamed mucous membranes and also to help speed up a protracted labour[222]. A snuff made from the pulverised root bark has been used to cause sneezing in comatose patients[257]. A tea made from the leaves and pulp from the pods is laxative and has also been used in the treatment of reflex troubles[222]. A decoction of the fresh green pulp of the unripe fruit is used in homeopathic practice[82].

propta Seed - best sown in a greenhouse as soon as it is ripe[200]. The seed can also be sown in early spring in a greenhouse[78]. Scarification and pre-soaking the seed for 24 hours in warm water, especially if it has been stored, will improve germination[200]. Make sure the seed has swollen after soaking, soak it again if it has not and, if it still does not swell, try filing away some of the seedcoat but be careful not to damage the embryo. As soon as they are large enough to handle, prick the seedlings out into fairly deep individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Consider giving them some protection against the cold for their first couple of winters outdoors Root cuttings 4cm long and 1cm thick in a greenhouse in December[200]. Plant the roots horizontally in pots[78]. Good percentage.

nwatta Landscape Uses:Pest tolerant, Specimen, Street tree. Requires a deep rich soil and a sunny position[1, 200]. Tolerates drought, atmospheric pollution, salt and limestone soils[200]. A very cold-hardy plant, tolerating temperatures down to about -30°C[200]. A very ornamental[1] but slow growing tree[11], it rarely flowers in Britain, requiring more summer heat than it usually gets here[11, 200]. Trees in the wild seldom live longer than 100 years[229]. The tree has a light canopy so does not cast much shade[200], making it a good tree to use for the top canopy of a woodland garden.

Dioecious. Male and female plants must be grown if seed is required. Unlike most members of the Leguminosae, his species does not form nodules of nitrogen-producing bacteria on the roots[274]. Special Features: North American native, Fragrant flowers, Inconspicuous flowers or blooms.

### 4.1.10 *Comptonia peregrina*

Sweet Fern

tfo2n 3 tlin 6 cyuc 3 kcaak 3 tcan 3 dwat 1.5 m hkuc hmitmht cyutli hgatkyuctcup hwicli hyishrasljut hpa7tli frusflat hpa7tmwatli hjonli

drutta *Comptonia peregrina* is a deciduous Shrub growing to 1.5 m (5ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit LeavesEdible Uses: Condi- ment TeaThe young fruits are eaten as a pleasant nibble[55, 62, 183]. The aromatic leaves, fresh or dried, are used to make a palatable tea[55, 62, 102, 183]. The leaves are also used as a seasoning[183]. The bristly burr that contains one to four edible nutlets (Peter Alden and Brian Cassie (1999). National Audubon Society Field Guide to the Mid-Atlantic States.)

tcanta Incense Lining Parasiticide RepellentThe leaves are used as a lining in baskets etc in order to preserve the fruit[55]. The crushed leaves repel insects[102]. They can be thrown onto a camp fire to keep mosquitoes away[257]. The dried leaves have been burnt as an incense[257].

dwatta Astringent Blood purifier Expectorant Febrifuge Odontalgic Parasiticide Poultice TonicSweet fern was employed medicinally by several native North American Indian tribes who used it especially as a poultice to treat a variety of complaints[257]. It is still used for most of the same purposes in modern herbalism. The leaves are astringent, blood purifier, expectorant and tonic[21, 62, 222, 257]. A tea made from the leaves and flowering tops is used as a remedy for diarrhoea, headache, fevers, catarrh, vomiting of blood, rheumatism etc[213, 222, 257]. The infusion has also been used to treat ringworm[257]. The leaves have also been used as a poultice for toothaches, sprains etc[238, 257]. A cold water infusion of the leaves has been used externally to counter the effect of poison ivy[213, 222, 257] and to bathe stings, minor haemorrhages etc[238]. The leaves are harvested in early summer and dried for later use[238].

propta Seed - it has a very tough seed coat and also contains germination inhibitors and so is very difficult to germinate[113]. It is probably best to harvest the seed 'green' (after the seed has fully developed but before it dries on the plant) and sow immediately in a cold frame. If the seed has been stored then soaking in hot water for 24 hours will leach out some of the inhibitors and also help to soften the seed coat. Scarification will also help as will a period of cold stratification. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out into their permanent positions in late spring or early summer[K]. Root cuttings, 4cm long December in a frame[78, 113]. Plant the root horizontally. High percentage[78]. Suckers removed in the dormant season and potted up or planted into their permanent positions[200]. Plants can be difficult to move successfully[238]. Layering in spring[238].

nwatta Landscape Uses:Arbor, Border, Container, Erosion control, Foundation, Ground cover, Massing, Rock garden, Specimen. Requires a peaty or light loam lime-free soil[11, 182, 200]. Requires an acid well-drained soil of low to medium fertility in partial shade but tolerates full sun if the soil does not dry out in the summer[200]. Tolerates dry sandy soils when grown in the shade[200]. A very ornamental plant[1], it is hardy to at least -25°C[184, 200]. The crushed leaves are very aromatic[182], their scent is most noticeable in the early morning and the evening[238]. The scent increases when the leaves are dried[245]. This species is some-

### 3.1.8 *Amorpha canescens*

Lead Plant

tfo2n 2 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 1.2 m hkuc hmitmht cyutli hgatkyuctcup hwicli hyishrasljut hpa7tli flat-prikliw hpa7tmwatli xre7t hjonli

drutta *Amorpha canescens* is a deciduous Shrub growing to 1.2 m (4ft) by 1.5 m (5ft in). See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: OilEdible Uses: Oil TeaAn infusion of the dried leaves makes a pleasant tasting yellow-coloured tea[161, 177, 183, 257].

tcanta Insecticide Miscellany Oil Repellent Shelterbelt Soil stabilizationPlants have an extensive root system, they tolerate poor dry soils and are also wind resistant, they are used as a windbreak and also to prevent soil erosion[200]. Resinous pustules on the plant contain 'amorpha', a contact and stomachic insecticide that also acts as an insect repellent[57, 200].

dwatta Anthelmintic Eczema Miscellany Salve Skin StomachicAn infusion of the leaves has been used to kill pinworms or any intestinal worms[257]. The infusion is also used to treat eczema, the report does not say if it is used internally or externally[257]. The dried and powdered leaves are applied as a salve to cuts and open wounds[257]. A decoction of the root is used to treat stomach pains[257]. A moxa of the twigs has been used in the treatment of neuralgia and rheumatism[257].

propta Seed - presoak for 12 hours in warm water and sow early spring in a greenhouse[78, 133]. The seed usually germinates in 1 - 2 months at 20°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, June/July in a frame. High percentage[78]. Cuttings of mature wood of the current seasons growth, autumn, in a sheltered position outdoors. Takes 12 months[78]. Suckers in spring just before new growth begins[200]. Layering in spring .

nwatta Prefers a light well-drained sandy soil in sun or light shade[1, 200]. Tolerant of poor dry soils, plants can be invasive in rich soils[200]. Wind resistant[200]. A very hardy plant, tolerating temperatures down to about -25°C[184, 200] but it frequently dies down to ground level in the winter, re-sprouting from the base in the following spring[182]. A very ornamental plant[1]. A deep rooted plant, it thrives best in hot, droughty seasons[11]. It only ripens its seed in fine autumns[11]. Immune to insect pests, the plant contains its own insecticide[200]. At one time this plant was supposed to indicate the presence of lead in the soil[182]. There is some confusion over the correct author of the Latin name of this plant. It is probably Pursh. as stated on the top of this sheet, but some books cite Nutt. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from

the plant [1-2].

### 3.1.9 *Alnus sinuata*

Sitka Alder

tfo2n 2 tlin 9 cyuc 1 kcaak 3 tcan 1 dwat 4 m hkuc hmitmht cyutli tucpjh7n hwicli hysiljutykifrip hpa7tli flat-prikliw hpa7tmwatli hjonli

drutta *Alnus sinuata* is a deciduous Shrub growing to 4 m (13ft 1in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from April to June, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FlowersEdible Uses: Catkins - raw or cooked. A bitter flavour[172].

tcanta Fuel Pioneer Soil stabilization Tannin WoodThis is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc[226]. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. The bark and the strobils are a source of tannin[82]. The tree has an extensive root system and can be planted to control banks from erosion[226, 229]. Wood - soft, straight-grained, very durable in water[82]. The tree is too small to be of use as a source of lumber, but the wood is used locally for fuel[226, 229].

dwatta Astringent Emetic Haemostatic Stomachic TonicThe bark is astringent, emetic, haemostatic, stomachic and tonic[172].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. This species is closely related to *A. viridis* and is included as a sub-species of *A. viridis* by many botanists[11]. A fast-growing but short-lived species, rarely living longer than 50 years[229]. It is a pioneer species of logged or burnt land, often forming dense thickets in low wet areas[229]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 3.1.10 Lathyrus odoratus

Sweet Pea, Wild Pea,Vetchling

tfo2n 2 tlin 11 cyuc 1 kcak 3 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lathyrus odoratus is a ANNUAL CLIMBER growing to 2 m (6ft 7in) at a fast rate. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta The seeds are rich in vitamin A[240], though the report does not say that the seeds are edible[K].

tcanta EssentialAn essential oil obtained from the flowers is used in perfumery[46, 61]. Nitrogen Fixer.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can be sown in situ in mid spring[200]. The seed can also be sown in situ in the autumn[1, 134].

nwatta Landscape Uses:Arbor, Border, Container, Ground cover, Screen. An easily grown plant, succeeding in only moderately good well-drained garden soil[200], whether acid or alkaline[202]. Prefers a position in full sun[200] but it also does well in partial shade[1]. A very ornamental plant, the sweet pea is often cultivated for its sweet smelling flowers, there are many named varieties[1]. Plants climb by means of tendrils[188]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, All or parts of this plant are poisonous, Suitable for cut flowers, Fragrant flowers.

### 3.1.11 Alnus rugosa

Speckled Alder

tfo2n 2 tlin 6 cyuc 0 kcak 3 tcan 2 dwat 22 m hkuc hmimhtut cyutli tcuphja7n hwicli hysijlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Alnus rugosa is a deciduous Tree growing to 22 m (72ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta None known

tcanta Dye Pioneer Soil stabilization WoodThis is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc[226]. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. The tree has an extensive root system and can be planted to control banks from erosion[226]. A dark dye is obtained from the bark[226]. Browns, through red to orange colours can be obtained from the bark[257]. The wood is soft, weighing 29lb per cubic foot[235]. The tree is too small to be of importance for lumber or fuel[229].

dwatta Alternative Anodyne Astringent Cathartic Emetic Febrifuge Odontalgic Ophthalmic Stomachic TonicThe speckled alder was quite widely used medicinally by the native

North American Indians who used it to treat a variety of complaints[257]. It is little used in modern herbalism. The bark is alterative, astringent, emetic, laxative, ophthalmic, stomachic and tonic[46, 61, 257]. The bark contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226]. The root bark was mixed with molasses and used in the treatment of toothache[257]. A decoction of the inner bark was used as a wash for sore eyes[257]. The outer bark is astringent and is applied as a poultice to bleeding wounds, it also reduces swellings[226].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. A fast-growing but short-lived tree[229]. Closely related to *A. incana*[11] and considered to be no more than a sub-species (*A. incana rugosa*) by some botanists[226]. This species has a symbiotic relationship with certain soil microorganisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 3.1.12 Alnus incana

Grey Alder, Speckled alder, Thinleaf alder, White Alder

tfo2n 2 tlin 6 cyuc 0 kcak 3 tcan 0 dwat 18 m hkuc hmimhtut cyutli kywctcuphja7n hwicli hysijlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Alnus incana is a deciduous Tree growing to 18 m (59ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from February to March. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil. The plant can tolerate maritime exposure.

ckakta None known

tcanta Pioneer Soil reclamation Tannin WoodThis species fixes atmospheric nitrogen and is also tolerant of polluted soils, it can be used for land reclamation, especially on coal tips[200]. This is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. The bark and the fruits contain up to 20% tannin[46, 61, 223]. Wood - light, soft, fairly elastic, easy to split. Used for clogs, bowls, woodcuts etc. Much valued by cabinet makers[46, 61].

dwatta None known

from the fruit trees by up to 10%. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 4.1.6 Glycyrrhiza lepidota

American Licuorice

tfo2n 3 tlin 8 cyuc 4 kcak 3 tcan 3 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Glycyrrhiza lepidota is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[2, 46, 61, 203]. Long, sweet and fleshy[105], when slow roasted they are said to taste like sweet potatoes[183, 207]. They can be used as a flavouring in other foods and can also be chewed raw as a masticatory[177, 183, 212], making an excellent tooth cleaner and also very good for teething children. The root contains 6% glycyrrhizin, a substance that is 50 times sweeter than sugar[183]. The tender young shoots can be eaten raw in the spring[183, 257].

tcanta Nitrogen fixer. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Birthing aid Foot care Odontalgic Poultice TonicAmerican licuorice was widely employed medicinally by a number of native North American Indian tribes who used it in the treatment of a range of diseases[257]. All parts of the body are medicinal, but the roots are the most active part. This species has properties similar to other licuorices which are widely used medicinally, though this species is rather neglected in modern literature. An infusion of the root is used to speed the delivery of the placenta after childbirth, it is also used to treat coughs, diarrhoea, chest pains, fevers in children, stomach aches etc[207, 257]. It is also used as a wash or poultice on swellings[257]. The chewed root is retained in the mouth as a treatment for toothache and sore throats[207, 257]. The mashed leaves are used as a poultice on sores[207, 257]. The leaves have been placed in the shoes to absorb moisture[257].

propta Pre-soak the seed for 24 hours in warm water and then sow spring or autumn in a greenhouse[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in a greenhouse. Plant out in late spring or early summer when in active growth. Plants are rather slow to grow from seed[238]. Division of the root in spring or autumn. Each division must have at least one growth bud. Autumn divisions can either be replanted immediately or stored in clamps until the spring and then be planted out[200]. It is best to pt up the smaller divisions and grow them on in a cold frame until they are established before planting them out in the spring or summer.

nwatta Requires a deep well cultivated fertile moisture-retentive soil for good root production[200]. Prefers a sandy soil with abundant moisture[238]. Slightly alkaline conditions produce the best plants[238]. A very deep-rooted plant, it can be difficult to eradicate once it is established[238]. Unless seed is required, the plant is usually prevented from flowering so that it puts more energy into producing good quality roots[238]. Plants are growing very well at Kew[K]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant

growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.1.7 Hedysarum boreale mackenzii

Liquorice Root

tfo2n 3 tlin 7 cyuc 4 kcak 0 tcan 0 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hedysarum boreale mackenzii is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: RootEdible Uses: Root - raw or cooked[177]. Long and sweet[46, 61] with a licuorice-like flavour[183]. Used in spring, the root is crisp and juicy but it becomes tough and woody as the season advances[2, 183].

tcanta None known

dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil in a sunny position, preferring a deep well-drained sandy loam[1, 200]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. Does well in the rock garden or border[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 4.1.8 Hedysarum boreale

Sweet Vetch, Utah sweetvetch, Northern sweetvetch

tfo2n 3 tlin 7 cyuc 4 kcak 3 tcan 0 dwat 0.1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hedysarum boreale is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: RootEdible Uses: Young tender roots - raw or cooked[183]. Sliced and eaten raw, boiled, baked or added to soups[183]. A sweet carrot[105] or licuorice-like flavour[183].

tcanta None known

dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil in a sunny position, preferring a deep well-drained sandy loam[1, 200]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the

#### 4.1.4 *Elaeagnus parvifolia*

Autumn olive

tfo2n 3 tlin 7 cyuc 4 ckak 2 tcan 2 dwat 4.5 m hkuc htuc cyutli hgatkuyctcup hwicli hyhshrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Elaeagnus parvifolia* is a deciduous Shrub growing to 4.5 m (14ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw, cooked or added to curries[2, 105, 183]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent - though children seem to love it at the slightly unripe stage[K]. The fruit is about 8mm in diameter[200] and contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous.

tcanta Hedge HedgeVery tolerant of maritime exposure, it can be grown as an informal hedge in exposed positions[75].

dwatta Astringent Cancer DysenteryThe unripe fruit is astringent and is eaten in the treatment of bloody dysentery[272]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in very poor soils and in dry soils[11, 200]. Prefers a light sandy loam and a sunny position[11]. Dislikes shallow chalk soils[98]. Plants are very drought resistant[1] and very tolerant of maritime exposure[75]. A very hardy plant, tolerating temperatures down to at least -40°C[200]. Somewhat similar to *E. multiflora*, but flowering a few weeks later[182]. The flowers are rich in nectar and very aromatic, they are much visited by bees. This species is notably resistant to honey fungus[88, 200]. Plants can fruit in 6 years from seed[160]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[160, 200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%.

#### 4.1.5 *Elaeagnus umbellata*

Autumn Olive

tfo2n 3 tlin 7 cyuc 4 ckak 3 tcan 2 dwat 4.5 m hkuc htuc cyutli hgatkuyctcup hwicli hyhshrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Elaeagnus umbellata* is a deciduous Shrub growing to 4.5 m (14ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen

from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[2, 46, 105]. Juicy and pleasantly acid, they are tasty raw and can also be made into jams, preserves etc[160, 183, 194]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The fruit contains about 8.3% sugars, 4.5% protein, 1% ash[194]. The vitamin C content is about 12mg per 100g[194]. Mature bushes in the wild yield about 650g of fruit over 2 - 3 pickings[194]. The harvested fruit stores for about 15 days at room temperature[194]. The fruit is about 8mm in diameter[200] and contains a single large seed[K]. Seed - raw or cooked[194]. It can be eaten with the fruit though the seed case is rather fibrous[160].

tcanta Companion Fodder Fuel Hedge HedgeVery tolerant of maritime exposure, it makes a good informal hedge, succeeding even in very exposed positions[75]. The plants make a reasonable wind-protecting screen, they are about as wide as they are tall. They make a good companion hedge, enriching the soil and fertilizing neighbouring plants[K]. The wood is a good fuel[146].

dwatta Astringent Cancer Cardiac Pectoral Stimulant Vitamin CThe flowers are astringent, cardiac and stimulant[240]. The seeds are used as a stimulant in the treatment of coughs[240]. The expressed oil from the seeds is used in the treatment of pulmonary affections[240]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global CropSucceeds in most soils that are well-drained[11, 200], though it dislikes shallow chalk soils[98]. It prefers a soil that is only moderately fertile, succeeding in very poor soils and in dry soils[11, 200]. Prefers a light sandy loam and a sunny position[11]. Established plants are very drought resistant[1]. A very hardy plant, tolerating temperatures down to at least -40°C[200]. This species is somewhat similar to *E. multiflora*, but it flowers a few weeks later[182]. Sometimes cultivated for its edible fruit, there are some named varieties[183]. 'Cardinal' and 'Red Wing' are very good fruiting forms (developed for ornament and not for fruit quality)[182]. 'Jazbo' has been bred for its edible fruits which are said to be ripe when 'they drop into your hand'[214]. This makes them valuable in breeding programmes to develop easily harvested fruits[214]. Flowers are rich in nectar and very aromatic, they are much visited by bees. Polymorphic[11, 275]. This species is notably resistant to honey fungus[88, 200]. Plants can fruit in 6 years from seed[160]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[160, 200]. An excellent companion plant, when grown in orchards it can increase yields

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Landscape Uses:Pollard, Specimen. Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Thrives in drier soils than many other members of this genus[200]. Tolerates very infertile sites[200]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attractive foliage, Not North American native, Wetlands plant, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 3.2 mran

### 3.2.1 *Cucurbita moschata*

Squash, Crookneck squash

2 tlin 11 cyuc 5 ckak 1 tcan 3 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Cucurbita moschata* is a ANNUAL CLIMBER growing to 0.6 m (2ft) by 4 m (13ft 1in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta Edible Parts: Flowers Fruit Leaves Oil SeedEdible Uses: OilFruit - cooked[2, 27, 46, 105]. Some cultivars have a delicious flavour when baked, rather like a sweet potato[K]. The flesh can be dried and ground into a powder then used in making breads etc[183]. Some varieties can be stored for up to 9 months. Seed - raw or cooked[57, 86, 105]. Rich in oil with a pleasant nutty flavour[183] but very fiddly to use because the seed is small and covered with a fibrous coat[K]. An edible oil is obtained from the seed[183]. Leaves and young stems - cooked and used as a potherb or added to soups, stews etc[105, 135, 183]. Flowers - cooked[105, 135, 183].

tcanta OilAn edible oil is obtained from the seed[183].

dwatta Anthelmintic GalactagogueThe seed is vermicifuge[147]. It is eaten fresh or roasted for the relief of abdominal cramps and distension due to intestinal worms[218]. About 800 peeled seeds is said to make a safe and effective treatment for tape worm[218]. They are ground into a fine flour, then made into an emulsion with water and eaten. It is then necessary to take a purge in order to expel the tape-worms or other parasites from the body[7]. The boiled root is galactagogue[218].

propta Seed - sow early to mid spring in a greenhouse in a rich soil. Germination should take place within 2 weeks. Sow 2 or 3 seeds per pot and thin out to the best plant. Grow them on fast and plant out after the last expected frosts, giving them cloche or frame protection for at least their first few weeks if you are trying them outdoors.

nwatta Requires a rich, well-drained moisture retentive soil and a very warm, sunny and sheltered position[1, 37, 86]. Prefers a pH of 5.5 to 5.9, but tolerates up to 6.8[86]. Moderate rainfall favours growth, but the roots of most cultivars are sensitive to high soil-water levels[200]. The squash is a frost-tender annual plant that is widely cultivated, especially in warm temperate and tropical areas, for its edible fruit[27]. There are very many named varieties widely differing in size shape and taste[27, 183]. Some varieties are used in the summer and autumn whilst others are harvested in the autumn and can be stored for several months. Succeeds outdoors most years in Britain[27]. Plants are more suited to warmer climates than Britain[200] and are only really successful in good summers in this country, they do not do well in the north[86]. Most cultivars are day-length neutral[200]. This species only hybridizes with other members of the genus under controlled conditions[86, 135]. Grows well with sweetcorn, radishes and nasturtium but dislikes potatoes[18, 20]. Squashes and pumpkins can be differentiated from each other by their fruit stalk, it is angular and polygonal in pumpkins but thick, soft and round in squashes[132].

### 3.2.2 *Zea mays*

Sweet Corn, Corn

2 tlin 11 cyuc 5 ckak 3 tcan 3 dwat m hkuc htuc cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Zea mays* is a ANNUAL growing to 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower from July to October, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

ckaakta Edible Parts: Oil Oil Pollen Seed StemEdible Uses: Coffee Oil OilSeed - raw or cooked. Corn is one of the most commonly grown foods in the world. The seed can be eaten raw or cooked before it is fully ripe[1, 2, 33, 34] and there are varieties especially developed for this purpose (the sweet corns) that have very sweet seeds and are delicious[183, K]. The mature seed can be dried and used whole or ground into a flour. It has a very mild flavour and is used especially as a thickening agent in foods such as custards[183]. The starch is often extracted from the grain and used in making confectionery, noodles etc[183]. The dried seed of certain varieties can be heated in an oven when they burst to make 'Popcorn'[183]. The seed can also be sprouted and used in making uncooked breads and cereals[183]. A nutritional analysis is available[218]. The fresh succulent 'silks' (the flowering parts of the cob) can also be eaten[55, 183]. An edible oil is obtained from the seed, it is an all-purpose culinary oil that is frequently used as a food in salads and for cooking purposes[13, 46, 183, 238]. The pollen is used as an ingredient of soups[183]. Rich in protein, it is harvested by tapping the flowering heads over a flat surface such as a bowl. Harvesting the pollen will actually help to improve fertilisation of the seeds[K]. The roasted seed is a coffee substitute[183]. The pith of the stem is chewed like sugar cane and is sometimes made into a syrup[183].

tcanta Adhesive Fuel Oil Packing PaperA glue is made from the starch in the seed[13]. This starch is also used in cosmetics and the manufacture of glucose[61]. A

semi-drying oil is obtained from the seed[57]. It has many industrial uses, in the manufacture of linoleum, paints, varnishes, soaps etc[21, 61]. The corn spathes are used in the production of paper, straw hats and small articles such as little baskets[74, 171]. A fibre obtained from the stems and seed husks is used for making paper[189]. They are harvested in late summer after the seed has been harvested, they are cut into usable pieces and soaked in clear water for 24 hours. They are then cooked for 2 hours in soda ash and then beaten in a ball mill for 1½ hours in a ball mill. The fibres make a light greenish cream paper[189]. Be careful not to overcook the fibre otherwise it will produce a sticky pulp that is very hard to form into paper[189]. The dried cobs are used as a fuel[171]. The pith of the stems is used as a packing material[171].

**dwatta** Cancer Cholagogue Demulcent Diuretic Hypoglycaemic Hypotensive Lithotropic Stimulant Vasodilator WartsA decoction of the leaves and roots is used in the treatment of strangury, dysuria and gravel[218]. The corn silks are cholagogue, demulcent, diuretic, lithotropic, mildly stimulant and vasodilator[4, 9, 165, 176, 218]. They also act to reduce blood sugar levels and so are used in the treatment of diabetes mellitus[9, 218] as well as cystitis, gonorrhoea, gout etc[222]. The silks are harvested before pollination occurs and are best used when fresh because they tend to lose their diuretic effect when stored and also become purgative[9]. A decoction of the cob is used in the treatment of nose bleeds and menorrhagia[218]. The seed is diuretic and a mild stimulant[4]. It is a good emollient poultice for ulcers, swellings and rheumatic pains[4], and is widely used in the treatment of cancer, tumours and warts[218]. It contains the cell-proliferant and wound-healing substance allantoin, which is widely used in herbal medicine (especially from the herb comfrey, *Symphytum officinale*) to speed the healing process[222]. The plant is said to have anticancer properties and is experimentally hypoglycaemic and hypotensive[218].

**propta** Seed - sow April in individual pots in a greenhouse. Grow on quickly and plant out after the last expected frosts. A direct outdoor sowing, especially of some of the less sweet varieties, can be tried in May.

**nwatta** Requires a warm position a well drained soil and ample moisture in the growing season[16, 33]. Prefers a pH in the range 5.5 to 6.8[200]. Requires a rich soil if it is to do well[201]. Corn is widely cultivated for its edible seed, especially in tropical and warm temperate zones of the world[200], there are many named varieties[132]. Unfortunately, the plant is not frost tolerant and so needs to be started off under glass in Britain if a reasonable crop is to be grown. There are five main types: Sweetcorn is of fairly recent development. It has very sweet, soft-skinned grains that can be eaten raw or cooked before they are fully ripe. Cultivars have been developed that can produce a worthwhile crop even in the more northerly latitudes of Britain if a suitable warm sunny sheltered site is chosen[238, K. Popcorn is a primitive form with hard-skinned grains. When roasted, these grains 'explode' to form the popular snack 'popcorn'[238]. Waxy corn is used mainly in the Far East. It has a tapioca-like starch[238]. Flint corn, which shrinks on drying, can have white, yellow, purple, red or blue-black grains[238]. It is not so sweet and also takes longer to mature so is a problematic crop in Britain. There are many other uses for this plant as detailed below. Dent corn has mostly white to yellow grains. This and Flint corn are widely grown for oils, cornflour, cereals and silage crops. Corn grows well with early potatoes, legumes, dill, cucurbits and sunflowers[18, 20, 201], it dislikes growing with tomatoes[20]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

### 3.2.3 Cucurbita maxima

**Winter Squash**  
2 tlin 11 cyuc 5 kcaak 2 tcan 3 dwat m hkuc hmimhht cyutli tcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli fyif hjonli

**drutta** Cucurbita maxima is a ANNUAL CLIMBER growing to 0.6 m (2ft) by 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost

tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaakta** Edible Parts: Flowers Fruit Leaves Oil Oil See Uses: Oil OilFruit - cooked[2, 27, 46, 97]. A delicious flavour when baked, rather like a sweet potato[K]. The flesh can be dried, ground into a powder and used with cereals in making bread, cakes etc[7, 183]. Some varieties can be stored for up to 9 months. Seed - raw or cooked[7, 57, 183]. Rich in oil with a very pleasant nutty flavour but very fiddly to use because the seed is small and covered with a fibrous coat[K]. The seed can also be ground into a powder and used with cereals in making breads etc[183]. An oil is obtained from the seed[21, 86]. Young flowers - raw or cooked[7, 135, 183]. They are often dipped in batter and fried. Young leaves and stems - cooked[135, 183]. The leaves contain up to 5% protein[183].

**tcanta** Cosmetic Oil OilThe seed contains 34 - 54% of a semi-drying oil[61, 86]. Used for lighting[21]. A nourishing face-mask can be made from the fruit that is effective for dry skins[7].

**dwatta** Diuretic Nervine Poultice Tonic VermifugeThe seeds are diuretic, tonic and vermifuge[7, 88, 240]. The complete seed, together with the husk, is used as a vermifuge. This is ground into a fine flour, then made into an emulsion with water and eaten. It is then necessary to take a purgative afterwards in order to expel the tapeworms or other parasites from the body[7]. As a remedy for internal parasites, the seeds are less potent than the root of *Dryopteris felix-mas*, but they are safer for pregnant women, debilitated patients and children[238]. The oil from the seed is used as a nerve tonic[240]. The fruit pulp is used as a soothing poultice on burns, inflammations and boils[240].

**propta** Seed - sow early to mid spring in a greenhouse in a rich soil. Germination should take place within 2 weeks. Sow 2 or 3 seeds per pot and thin out to the best plant. Grow them on fast and plant out after the last expected frosts, giving them cloche or frame protection for at least their first few weeks if you are trying them outdoors.

**nwatta** Requires a rich, well-drained moisture retentive soil and a very warm, sunny and sheltered position[37, 86]. Prefers a pH of 5.5 to 5.9, but tolerates up to 6.8[86]. Dry periods with a relatively low humidity favour the best growth[200]. A frost-tender annual plant, it is widely cultivated in tropical and temperate zones for its edible fruit, there are very many named varieties differing considerably in their fruits[183]. Most of the winter squashes derive from this species, including Hubbard, Butternut, Acorn, Argentine and Boston[86]. Many forms require a temperature range of 20 - 27°C during the growing season, but there are some forms that tolerate cooler conditions and these succeed outdoors most years in Britain[200, K]. Most cultivars are relatively insensitive to day-length[200]. Squashes and pumpkins can be differentiated from each other by their fruit stalk, it is angular and polygonal in pumpkins but thick, soft and round in squashes[132]. This species hybridizes readily with *C. andreana* but can only be crossed with other species under controlled conditions[86, 135]. Some modern works see *C. andreana* as being no more than a subspecies of this species, classifying it as *C. maxima andreana* (Naudin)/Filov. Grows well with sweetcorn and thornapple but dislikes potatoes[18, 20].

### 3.2.4 Brassica oleracea italica

**Broccoli**  
2 tlin 11 cyuc 5 kcaak 2 tcan 0 dwat 0.9 m hkuc hmimhht cyutli tcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli fyixre7t hjonli

**drutta** Brassica oleracea italica is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable

**tercrop** Staple Crop: OilLandscape Uses:Border, Seashore, Specimen. Succeeds in most soils[200], including poor ones[186], so long as they are not too dry[182, 200]. Grows well by water and in fairly wet soils[182]. Established plants are very drought resistant[186]. Requires a sunny position[3], seedlings failing to grow in a shady position and mature shrubs quickly dying if overshadowed by taller plants[186]. Does well in very sandy soils[1, 186]. Very tolerant of maritime exposure[75]. Plants are fairly slow growing[75]. Although usually found near the coast in the wild, they thrive when grown inland[11] and are hardy to about -25°C[184]. A very ornamental plant[1, 11], it is occasionally cultivated, especially in N. Europe, for its edible fruit, there are some named varieties[183]. 'Leikora' is a free-fruited form, developed for its ornamental value. Members of this genus are attracting considerable interest from breeding institutes for their nutrient-rich fruits that can promote the general health of the body (see edible and medicinal uses below)[214]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[113, 186, 200]. Plants produce abundant suckers, especially when grown on sandy soils[186]. Dioecious. Male and female plants must be grown if seed is required. The sexes of plants cannot be distinguished before flowering, but on flowering plants the buds of male plants in winter are conical and conspicuous whilst female buds are smaller and rounded[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Naturalizing, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

#### 4.1.3 Apios americana

**Ground Nut**  
tfo2n 3 tlin 7 cyuc 5 kcaak 3 tcan 1 dwat 1.2 m hkuc hmimhht cyutli tcup hwicli hrasljut hpa7tli frusflatprklwis hpa7tmwatli xre7t hjonli

**drutta** Apios americana is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from April to November, in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaakta** Edible Parts: Root Seed SeedpodEdible Uses: Tuber - raw or cooked[1, 2, 27, 55, 62, 63]. A delicious flavour somewhat like roasted sweet potatoes, it always receives very high marks in taste trials with us[K]. The tuber can also be dried and ground into a powder then used as a thickening in soups etc or can be added to cereal flours when making bread[132, 257]. Tubers contain 17% crude protein, this is more than 3 times that found in potatoes[183]. The tubers can be harvested in their first year but they take 2 - 3 years to become a sizeable crop[160]. They can be har-

vested at any time of the year but are at their best in the autumn[160]. The tubers can also be harvested in the autumn and will store until at least the spring[K]. Yields of 2.3 kilos of tubers per plant have been achieved[222]. Seed - cooked[62]. Rather small and not produced very freely[K], they are used like peas and beans[183, 213]. A good source of protein, they can be ground into a powder and added to cereals when making bread etc[257]. Young seedpods[55, 62, 95, 177].

**tcanta** Companion LatexThere is one report that the plant contains a latex which could be used in the production of rubber[269].

**dwatta** The tubers were used in folk remedies for that cancerous condition known as "Proud Flesh" in New England. Nuts were boiled and made into a plaster, "For to eat out the proud flesh they (the Indians) take a kind of earth nut boyled and stamped"[269].

**propta** Seed - pre-soak for 3 hours in tepid water and sow February/March in a cold frame. The seed usually germinates in 1 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for their first winter; planting them out in late spring or early summer. Division can be carried out at almost any time of the year, though spring is probably the best time. Simply dig up the roots, harvest the tubers and replant them where you want the plants to grow. It is also possible to harvest the tuber in winter, store them in a cool fairly dry but frost-free place over the winter and then plant them out in the spring. The tubers lose moisture rapidly once they have been harvested, so make sure that you store them in a damp medium such as leafmold.

**nwatta** Agroforestry Services: Nitrogen Edible Beans Management: Standard New Crop for Tubers Staple Crop: ProteinPrefers a light rich soil and a sunny position[1, 27]. When grown in a warm dry situation in a well-drained sandy soil, the plants will be long lived with the tuberous roots increasing in size and number each year[245]. Another report says that the plant prefers light dappled shade[200]. It tolerates acid soils[160]. Dislikes windy situations[K]. Groundnut is reported to tolerate an annual precipitation in the range of 97 to 117cm, an average annual temperature range of 9.9 to 20.3°C and a pH in the range of 4.5 to 7.0[269]. It tolerates a range of climatic conditions and produces well in cool temperate zones as well as the subtropical conditions of South Florida[269]. Whilst most reports suggest that this species should be cold hardy in all parts of Britain, one report says that the plants may require protection in severe winters[134]. The groundnut has occasionally been cultivated for its edible root and has the potential to become a commercial crop[95, 183]. Cultivars have been selected in the past for higher yields and larger tubers, it is said that the yields from some of these cultivars can rival potato crops[95, 183]. Some of these cultivars are gradually becoming available in Britain[K]. The best yields are obtained when the plant is left in the ground for at least two growing seasons. Yields of 30 tonnes per hectare have been achieved from weed crops growing in a field of cranberries[269]. This species has been grown in the past in S. Europe[46, 50] and has been suggested as a nitrogen-fixing edible ornamental for permaculturalists[222]. The plant forms long thin roots which enlarge at intervals along their length to form the tubers, the effect is somewhat like a necklace[K]. Plants can be invasive once they are established[200] and have become a weed of cultivated cranberry crops in N. America[269]. A climbing plant, twining around the thin branches of other plants for support[K]. The flowers have a scent of violets[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Herbaceous. A suckering vine sending up suckers some distance main plant [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

dwatta Cancer Cardiac Eczema Poultice Vitamin CThe tender branches and leaves contain bio-active substances which are used to produce an oil that is quite distinct from the oil produced from the fruit. This oil is used as an ointment for treating burns[214]. A high-quality medicinal oil is made from the fruit and used in the treatment of cardiac disorders, it is also said to be particularly effective when applied to the skin to heal burns, eczema and radiation injury, and is taken internally in the treatment of stomach and intestinal diseases[214]. The fruit is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - sow spring in a sunny position in a cold frame[78]. Germination is usually quick and good although 3 months cold stratification may improve the germination rate. Alternatively the seed can be sown in a cold frame as soon as it is ripe in the autumn. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a greenhouse for their first winter. Plant out in late spring into their permanent positions. Male seedlings, in spring, have very prominent axillary buds whilst females are clear and smooth at this time[78]. Cuttings of half-ripe wood, June/July in a frame[200]. Difficult[113]. This is the easiest method of vegetative propagation[214]. Cuttings of mature wood in autumn[200]. Difficult[113]. The cuttings should be taken at the end of autumn or very early in the spring before the buds burst. Store them in sand and peat until April, cut into 7 - 9cm lengths and plant them in a plastic tent with bottom heat[214]. Rooting should take place within 2 months and they can be put in their permanent positions in the autumn[214]. Division of suckers in the winter. They can be planted out direct into their permanent positions and usually establish well and quickly[K]. Layering in autumn[200].

nwatta Succeeds in most soils so long as they are not too dry[200]. Grows well by water[1, 11]. A fast-growing and very wind-resistant tree, it is an excellent pioneer species for re-establishing woodlands[K]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to about -10°C[200]. Members of this genus are attracting considerable interest from breeding institutes for their nutrient-rich fruits that can promote the general health of the body (see edible and medicinal uses below)[214]. The deeply cleft bark favours the growth of epiphytes[146]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Dioecious. Male and female plants must be grown if seed is required.

### 4.1.2 Hippophae rhamnoides

Sea Buckthorn, Seaberry  
tfo2n 3 tlin 7 cyuc 5 kcak 5 tcan 5 dwat 6 m hkuc  
htut cyutli hgatkuyctcuphja7n hwicli vyhshrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Hippophae rhamnoides is a deciduous Shrub growing to 6 m (19ft) by 2.5 m (8ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit - raw or cooked. Very rich in vitamin C (120mg per 100g)[74] and vitamin A[183], they are too acid when raw for most peoples tastes[11, 158], though most children seem to relish them[K]. Used for making fruit juice, it is high in vitamins and has an attractive aroma[141]. It is being increas-

ingly used in making fruit juices, especially when mixed with other fruits, because of its reputed health benefits[214]. The fruits of some species and cultivars (not specified) contain up to 9.2% oil[214]. The fruit is very freely borne along the stems[K] and is about 6 - 8mm in diameter[200]. The fruit becomes less acid after a frost or if cooked[74]. The fruit is ripe from late September and usually hangs on the plants all winter if not eaten by the birds. It is best used before any frosts since the taste and quality of frosted berries quickly deteriorates[214].

tcanta Charcoal Cosmetic Dye Fodder Fuel Oil Pioneer Soil stabilization WoodVery tolerant of maritime exposure[29, 49, 75, 182], it can be used as a shelter hedge. It dislikes much trimming[75]. A very thorny plant, it quickly makes an impenetrable barrier. Sea buckthorn has an extensive root system and suckers vigorously and so has been used in soil conservation schemes, especially on sandy soils. The fibrous and suckering root system acts to bind the sand[186, 244]. Because the plant grows quickly, even in very exposed conditions, and also adds nitrogen to the soil, it can be used as a pioneer species to help the re-establishment of woodland in difficult areas. Because the plant is very light-demanding it will eventually be out-competed by the woodland trees and so will not out-stay its welcome[K]. The seeds contain 12 - 13% of a slow-drying oil[240]. The vitamin-rich fruit juice is used cosmetically in face-masks etc[9]. A yellow dye is obtained from the fruit[74]. A yellow dye is obtained from the stems, root and foliage[4]. A blackish-brown dye is obtained from the young leaves and shoots[74]. Wood - tough, hard, very durable, fine-grained. Used for fine carpentry, turning etc[46, 61, 74]. The wood is also used for fuel and charcoal[146].

dwatta Astringent Cancer Cardiac Eczema Poultice Tonic Vermifuge Vitamin CThe twigs and leaves contain 4 - 5% tannin[240]. They are astringent and vermifuge[7, 100]. The tender branches and leaves contain bio-active substances which are used to produce an oil that is quite distinct from the oil produced from the fruit. Yields of around 3% of oil are obtained[240]. This oil is used as an ointment for treating burns[214]. A high-quality medicinal oil is made from the fruit and used in the treatment of cardiac disorders, it is also said to be particularly effective when applied to the skin to heal burns, eczema and radiation injury, and is taken internally in the treatment of stomach and intestinal diseases[214]. The fruit is astringent and used as a tonic[9, 254]. The freshly-pressed juice is used in the treatment of colds, febrile conditions, exhaustion etc[9]. The fruit is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214]. The juice is also a component of many vitamin-rich medications and cosmetic preparations such as face-creams and toothpastes[9]. A decoction of the fruit has been used as a wash to treat skin irritation and eruptions[254].

propta Seed - sow spring in a sunny position in a cold frame[78]. Germination is usually quick and good although 3 months cold stratification may improve the germination rate. Alternatively the seed can be sown in a cold frame as soon as it is ripe in the autumn. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a greenhouse for their first winter. Plant out in late spring into their permanent positions. Male seedlings, in spring, have very prominent axillary buds whilst females are clear and smooth at this time[78]. Cuttings of half-ripe wood, June/July in a frame[200]. Difficult[113]. This is the easiest method of vegetative propagation[214]. Cuttings of mature wood in autumn[200]. Difficult[113]. The cuttings should be taken at the end of autumn or very early in the spring before the buds burst. Store them in sand and peat until April, cut into 7 - 9cm lengths and plant them in a plastic tent with bottom heat[214]. Rooting should take place within 2 months and they can be put in their permanent positions in the autumn[214]. Division of suckers in the winter. They can be planted out direct into their permanent positions and usually establish well and quickly[K]. Layering in autumn[200].

nwatta Agroforestry Services: Alley crop Agroforestry Services: Nitrogen Agroforestry Services: Wind-break Fodder: Bank IndustrialCrop: Biomass Management Coppice Management: Standard Other Systems: Strip in-

for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young flowering stems and leaves - raw or cooked[33, 46]. The shoots of sprouting broccoli are harvested when about 10cm long, and before the flowers open, the shoots look somewhat like a small white or purple cauliflower and have a delicious flavour[K]. They are considered to be a gourmet vegetable. When picking the stems, make sure that you leave behind a section of the stem with leaves on it, since the plants will often produce new side shoots from the leaf axils[K]. Calabrese and Romanesco plants produce a central inflorescence rather like a small cauliflower, which are sometimes followed by a number of smaller flowering shoots. They usually come into bearing in the late summer or autumn and are very productive if they are regularly harvested. Sprouting broccoli plants come into production in late winter to early spring and can be very heavy bearing over a period of two months or more so long as all the flowering stems are harvested before coming into flower.

tcanta CompanionA good companion for celery and other aromatic plants since these seem to reduce insect predations[18, 20]. Grows badly with potatoes, beet and onions[20]. Grows well with potatoes, beet and onions according to another report[201].

dwatta None known

propta Seed - sow sprouting broccoli in a seedbed outdoors in March to May. Plant out in June. Do not let the seedlings get overcrowded or they will soon become leggy and will not make such good plants. If your seedlings do get leggy, it is possible to plant them rather deeper into the soil - the buried stems will soon form roots and the plant will be better supported. Romanesco and calabrese are often sown in situ in the spring.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[16, 200]. Tolerates a pH in the range 4.3 to 8.3. Prefers a heavy soil[16]. Succeeds in any reasonable soil[33]. Succeeds in maritime gardens[200]. Some forms are very cold-hardy, tolerating temperatures down to about -17°C[200]. Broccoli is closely related to the cauliflowers (C. oleracea botrytis) and is often grown for its edible young flowering stems which, by careful selection of varieties, can be available almost all year round from early summer right round to late spring. There are many named varieties and these can be classified into three main groups: Calabrese, which matures in summer and autumn, is the least cold-hardy form. It produces green, or sometimes purple, flowering heads[264]. Some forms will produce a number of side shoots once the main head has been harvested, though other forms seem unable to do this[264]. Romanesco matures in late summer and the autumn. It has numerous yellowish-green conical groups of buds arranged in spirals[264]. Given a little protection from the cold, it is possible to produce a crop throughout the winter. Unlike the other types of broccoli, romanesco seems unable to produce side shoots once the main head has been harvested[264]. Sprouting broccoli is the most cold-hardy group. It does not form a central head like the other two groups but instead produces a mass of side shoots from early spring until early summer. The more you harvest these shoots, especially if you do so before the flowers open, then the more shoots the plant produces[K]. A good companion for celery and other aromatic plants since these seem to reduce insect predations[18, 20]. Grows badly with potatoes, beet and onions[20]. Grows well with potatoes, beet and onions according to another report[201].

### 3.2.5 Rubus arcticus

Arctic Bramble, Arctic raspberrry, Dwarf raspberrry  
2 tin 7 cyuc 5 kcak 1 tcan 0 dwat 0.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli xr7t hjonli

drutta Rubus arcticus is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 1. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is

pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers FruitEdible Uses: TeaFruit - raw or cooked[2, 61, 105, 257]. Very sweet, juicy and palatable with a pineapple-like aroma[1, 101, 172, 183]. Delicious when eaten out of hand, they are also used in making cakes, jams etc[183]. Unfortunately, they are often not produced very prolifically in a garden situation in Britain, probably because they prefer colder winters. Flowers - raw. Sweet and delicious[172]. The fresh or dried leaves are used as a tea substitute[61, 105, 183].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Division in early spring or just before leaf-fall in the autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Easily grown in a good well-drained loamy soil in a sunny position[1, 11]. A very variable species, it is sometimes divided into three species, viz.: R. arcticus, R. acaulis and R. stellatus[101]. Suitable for growing in containers. Most often in acidic soils rich in organic matter. Rubus arcticus subsp. x stellarcticus G.Larss. is an unresolved name

This name is unresolved, but some data suggest that it is synonymous with Rubus x stellarcticus (G.Larss.) H.E.Weber, but some data suggest that it is an infraspecific name of Rubus arcticus L..

### 3.2.6 Viburnum lentago

Sheepberry, Nannyberry, Nannyberry Viburnum  
2 tin 8 cyuc 4 kcak 0 tcan 1 dwat 9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum lentago is a deciduous Tree growing to 9 m (29ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 55, 62, 65, 257]. It can also be dried for winter use[55]. The fruit is variable in size and quality, the best being about 15mm long, pulpy, very sweet, somewhat juicy and pleasant tasting but with a thick skin and a single large seed[43, 82, 101, 159, 183]. The fruit is said to be best after a frost[102] but it is sometimes dry[159].

tcanta Hedge Hedge WoodThe plant is grown as a hedge in N. America[226]. Wood - heavy, hard, close grained, malodorous[82, 226]. Of no commercial value due to the small size of the trees[229].

dwatta Antispasmodic Diuretic EmmenagogueThe bark is antispasmodic[102]. A decoction of the roots has been used to treat irregular menstruation and the spitting of blood[257]. An infusion of the leaves has been used in the treatment of measles[257]. An infusion of the leaves has been drunk, or a poultice of leaves applied, in the treatment of dysuria[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113].

Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[11]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. A very hardy plant, tolerating temperatures down to about -30°C[184]. A fast-growing but short-lived species in the wild[229]. It readily sprouts from the roots and forms thickets, a habit that is undesirable in small gardens[226]. The plants grow well, but do not usually fruit well in Britain[11, 200]. This is probably because they are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Special Features: North American native, Attracts butterflies, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 3.2.7 Asparagus officinalis

Asparagus, Garden asparagus  
2 tlin 9 cyuc 4 kcaak 2 tcan 3 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrashljutnyk hpa7tli frusflatprikli-wissliphsum hpa7tmwatli nyanhjen hjonli

drutta Asparagus officinalis is a PERENNIAL growing to 1.5 m (5ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in August, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid, very alkaline and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Shoots StemEdible Uses: CoffeeYoung shoots - raw or cooked[2, 5, 15, 16, 27, KJ. Considered a gourmet food[132], the shoots are harvested in the spring. We find them very acceptable raw in salads, with a hint of onion in their flavour[K]. They are normally boiled or steamed and used as a vegetable[K]. Male plants produce the best shoots[1]. Do not over-harvest the plant because this would weaken it in the following year. The shoots are a good source of protein and dietary fibre[201]. Roasted seeds are a coffee substitute[21, 46, 183].

tcanta InsecticideThe plant contains asparagusic acid, which has nematocidal properties[238].

dwatta Antibiotic Antispasmodic Aperient Cancer Cardiac Demulcent Diaphoretic Diuretic Laxative Sedative Tonic UrinaryAsparagus has been cultivated for over 2,000 years as a vegetable and medicinal herb[238]. Both the roots and the shoots can be used medicinally, they have a restorative and cleansing effect on the bowels, kidneys and liver[238]. The plant is antispasmodic, aperient, cardiac, demulcent,

diaphoretic, diuretic, sedative and tonic[4, 21, 165, 201, 240]. The freshly expressed juice is used[4]. The root is diaphoretic, strongly diuretic and laxative[9, 218, 222]. An infusion is used in the treatment of jaundice and congestive torpor of the liver[240]. The strongly diuretic action of the roots make it useful in the treatment of a variety of urinary problems including cystitis[254]. It is also used in the treatment of cancer[218]. The roots are said to be able to lower blood pressure[7, 222]. The roots are harvested in late spring, after the shoots have been cut as a food crop, and are dried for later use[7]. The seeds possess antibiotic activity[222]. Another report says that the plant contains asparagusic acid which is nematocidal and is used in the treatment of schistosomiasis[238].

propta Seed - pre-soak for 12 hours in warm water and then sow in spring or as soon as the seed is ripe in early autumn in a greenhouse. It usually germinates in 3 - 6 weeks at 25°C[134]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a sunny position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Division in early spring as the plant comes into growth.

nwatta Easily grown in any good garden soil[16]. Prefers a rich well-drained sandy loam and a sunny position[1, 16, 27, 238]. Prefers a pH of 6.5 or higher[200], though it tolerates a pH in the range 4.3 to 8.2. Asparagus is often cultivated as a luxury vegetable, there are some named varieties[16, 183]. Well-tended plants can be long-lived, an asparagus bed can last for well over 20 years. Asparagus is a good companion plant for tomatoes, parsley and basil[18, 20, 201]. When grown together, tomatoes help to protect asparagus from the asparagus beetle[201]. Asparagus is said to repel the nematodes that can infect tomatoes[201] (see the report below on the plants other uses). A good bee plant[108]. Dioecious. Male and female plants must be grown if seed is required. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.8 Vaccinium australe

Northern Blueberry  
2 tlin 7 cyuc 4 kcaak 2 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrashljut hpa7tli frusflat hpa7tmwatli dyat hjonli

drutta Vaccinium australe is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. The flowers are pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcaakta Fruit - raw or cooked[2, 3, 43, 62, 161]. It is usually sweet and juicy, though the flavour can be variable[11]. It can be used in pies, pastries, cereals, jellies etc[183]. The fruit can also be dried and used like raisins[183]. The fruit is rich in vitamin C[201]. The fruit is about 15mm in diameter[200]. A tea is made from the leaves and dried fruit[101].

tcanta A good bee plant. Acid soil. A purple dye can be made from the fruit and leaves. Landscape Uses: Border, Massing, Seashore. Special Features: Attracts birds and butterflies. Attractive flowers or blooms. Edible, wetlands plant.

dwatta Vitamin CAstringent, pectoral[201].

nwatta A North American native low maintenance sedge. Prefers a sandy or gravelly soil with a neutral to alkaline pH. Prefers a medium moisture, well-drained soil but will tolerate dry conditions. Very tough tolerating heat and drought. It handles dry conditions best when planted in shade. Light: Sun: Part shade to full shade. USDA Hardiness Zone: 2 to 8. Bloom Time: April. Tolerate: Deer, Heavy Shade. Plants spread slowly by rhizomes. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

### 3.2.55 Gymnocarpium dryopteris

Northern oak fern  
2 tlin 7 cyuc 0 kcaak 3 tcan 0 dwat 0.3 m hkuc  
pcimhmim cyutli kyuctcuphja7n hwicli hrashljut hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta Gymnocarpium dryopteris is a deciduous Fern growing to 0.3 m (1ft) by 0.3 m (1ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcaakta None Known

tcanta A good medium density groundcover for a woodland garden; their lush, bright green fronds brighten a dark forest floor. Grizzly Bear and Elk have been observed eating Oak Fern. Locations: Accent: Good Texture/Form. Flower borders and beds. Ground Cover. Cottage and Informal. Garden Architectural. Massed. Wild Flower. Woodland. Cut Flower (leaf). Containers.

dwatta None known

propta Sow spores at 15°C (59°F) when ripe or divide in spring

nwatta A small deciduous Mat forming fern with a slender creeping rhizome, and much-divided, triangular to ovate fronds. USDA Hardiness Zones: 2 - 7. Soil pH: 4.5 - 6.4. Growth Rate: Slow to moderate. Life Span: Long. Texture: Fine. Sun: Partial Shade, Shade. Prefers a neutral to acid, leafy, moist soil, enriched with garden compost, in deep shade. Soil Type: Loamy. Soil Moisture: Moderate. Minimum Root Depth: 12 inches (30cm). Root Type: Long Rhizome. Seasonal Interest: Spring-Fall. The broadly triangular leaves are divided into 3 approximately equal primary divisions, each turned to a heavily horizontal position. Sprawling, it often shows slightly twisted leaves and leaflets. Requires cool, moist, acidic soil. Good ground cover. Drought: Intolerant. Flood: Moderate. Salt: Sensitive. Soil Compaction: Intolerant. Mowing: Intolerant. Fire Damage: Intolerant. Cold Injury: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Plant Concerns: Oak fern can interfere with the growth of Engelmann spruce (*Picea engelmannii*) seedlings. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.56 Polytrichum commune

Common haircap, Great golden maidenhair,  
2 tlin 10 cyuc 0 kcaak 3 tcan 1 dwat 0.2 m hkuc  
pcimhmimhtut cyutli tcuphja7n hwicli hyishrasljutnyk hpa7tli frusflat hpa7tmwatli hjonli

drutta Polytrichum commune is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland)

semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None Known

tcanta A low to medium density groundcover with a mat forming habit. An Ornamental for shady, damp areas. It is used by some people to make a tea to dissolve kidney and gall bladder stones (borealforest.org). Good for hair. Made into a tea to rinse to strengthen hair. Stems have been woven and used to make baskets (tolweb.org).

dwatta Used by some people to make a tea to dissolve kidney and gall bladder stones (borealforest.org).

propta Spores. During the summer spores are released and carried by the wind.

nwatta Prefers lightly shaded areas with moist slightly acidic soil, it can also survive in areas of full sunlight provided the soil is moist. Can also grow in areas of poor soil and slow drainage. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2].

## 4 3 tlin

### 4.1 bwon

#### 4.1.1 Hippophae salicifolia

Willow-Leaved Sea Buckthorn  
tfo2n 3 tlin 7 cyuc 5 kcaak 5 tcan 3 dwat 15 m hkuc  
htut cyutli kyuctcuphja7n hwicli hyishrasljutnyk hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Hippophae salicifolia is a deciduous Tree growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8 and is not frost tender. It is in flower in April, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 46]. A very nutritious food, and possibly the most nutritious fruit that can be grown in temperate climates. It is very rich in vitamins, especially vitamin C, plus minerals and bioflavonoids, and is also a source of essential fatty acids[214]. It comes ripe in late summer, though it can be eaten for about a month before this, and will hang on the tree until mid-winter, by which time the flavour has become much milder, though it has also become very soft and difficult to pick[K]. We and many of our visitors really like this fruit, however the flavour is somewhat like a sharp lemon and a lot people find this too acid for them[K]. It also makes a good salad dressing[K]. The fruits of some species and cultivars (not specified) contain up to 9.2% oil[214]. The fruit is used for making preserves[105, 183]. It is being increasingly used in making fruit juices, especially when mixed with other fruits, because of its reputed health benefits[214]. The fruit becomes less acid after a frost or if cooked[74].

tcanta Fuel Pioneer Soil stabilization WoodThe plant is very fast growing, even in areas exposed to maritime winds, and it makes an excellent pioneer species for providing shelter and helping to establish woodland conditions. The plant is very light-demanding and so will eventually be shaded out by the woodland trees, thus it will never out-stay its welcome[K]. The trees have an extensive and vigorous root system and sucker freely once established. They are thus excellent for stabilising the soil, especially on slopes, and are often planted in the Himalayas to prevent land slips on the mountain slopes and create conditions for the re-establishment of woodlands[K]. The wood is very tough and hard - it can be used for many purposes including wheel hubs and other applications where toughness is essential[K]. It is also used for fuel[146].



febrifuge[226]. The bark of this species is used interchangeably with *S. alba*. It is taken internally in the treatment of rheumatism, arthritis, gout, inflammatory stages of auto-immune diseases, diarrhoea, dysentery, feverish illnesses, neuralgia and headache[238]. The bark is removed during the summer and dried for later use[238]. The leaves are used internally in the treatment of minor feverish illnesses and colic[238]. The leaves can be harvested throughout the growing season and are used fresh or dried[238].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. A relatively slow-growing but extremely durable plant when growing in very exposed positions[199]. Closely related to *S. caprea*[11]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 3.2.52 Helianthus decapetalus

Thinleaf sunflower

2 tin 8 cyuc 0 kcak 2 tcan 0 dwat 1.2 m hkuc  
hmimhtu cyuti tcup hwicli hyishrasjlutnyik hpa7tli flatprik  
hpa7tmwatli hjonli

drutta *Helianthus decapetalus* is a PERENNIAL growing to 1.2 m (4ft) by 1.2 m (4ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None Known

tcanta Cut Flowers or Dried Flowers. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2].

dwatta None known

propta

nwatta An attractive upright rhizomatous perennial wildflower. Prefers partial sun or dappled sunlight, moist to mesic conditions, and a rich loamy soil. Like other perennial sunflowers, this species may spread aggressively in some situations. Time to full growth: 2 to 5 years. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.53 Caragana frutex

Russian pea shrub

2 tin 7 cyuc 0 kcak 2 tcan 0 dwat 1.2 m hkuc  
htut cyuti hgtakuyctcup hwicli hyishrasjlut hpa7tli flatprik-  
wis hpa7tmwatli hjonli

drutta *Caragana frutex* is a deciduous Shrub growing to 1.2 m (4ft) by 1.2 m (4ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedpodEdible Uses: *Caragana* species are in the Legume Family, and well known for producing edible pods and peas. The pods are cylinder shaped and 2-3 cm long (1"). We could find no reference for this species is edible but it is likely!

tcanta Soil stabilizationAgroforestry Uses: The plant is useful for stabilizing soil on slopes[74]. Fixes nitrogen [1-2]. Other uses: Grown as an ornamental in gardens[74].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200 ] . It usually germinates in 2 weeks[K ]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78 , 113 , 200 ]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138 ]. Germination usually takes place within 2 - 3 weeks at 20°C[138 ]. Good percentage[11 ]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, mid summer in a frame[113 ]. Layering in spring.

nwatta *Caragana frutex* prefers a continental climate with its hot summers, cold winters and usually a clear movement from one season to another. The dormant plant can tolerate temperatures down to at least -30°C, but in more maritime climates it is often tempted to come into growth early and this new growth can easily be damaged by late spring frosts[200]. Prefers full sun and a light sandy dry or well-drained soil[1, 11, 200]. Does not require a rich soil, succeeding on marginal land[11]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Profusely-branched, deciduous shrub; it can grow 50 - 150cm tall, occasionally to 300cm[11, 74]. The plant produces long, often erect, supple branches, that are not much divided except near the ends[11]. The plant produces suckers and can spread to form a thicket of growth[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 3.2.54 Carex eburnea

Bristleleaf sedge

2 tin 8 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkuc  
pcimhmim cyuti hgtakuyctcup hwicli hyishrasjlutnyik  
hpa7tli flatprikwissiip hpa7tmwatli hjonli

drutta *Carex eburnea* is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind, Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Ground cover. An attractive first-rate ground cover. Shade and drought tolerant. Good for forest gardens, Rock gardens and shade gardens. An effective accent for smaller gardens. Lawn Alternative.

dwatta None Known

propta Propagate by seed, or clump division in early spring. Can be cut back regularly during its growing season.

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of greenwood, May/June in a shady position in a compost that contains some peat[113]. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Cuttings of mature wood, harvested in November and stored in a fridge then planted in a frame in March. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Blueberries: In warmer areas grow Southern Highbush and Rabbiteye (low chill) varieties while in cooler areas and areas that experience frost grow Northern Highbush (high chill) varieties. Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Hardy to about -25°C[184]. Often cultivated for its edible fruit in America[183]. It usually blossoms freely in Britain[11]. Plants are at least partially self-sterile, more than one variety is required in order to obtain good yields of fruit[182]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. leave the fruit on the shrub until the last minute, as the fruit is very acidic and will not ripen after being picked. Does not grow well with blackberries or raspberries[201]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 3.2.9 Smilacina racemosa

False Spikenard

2 tin 8 cyuc 4 kcak 2 tcan 2 dwat 1 m hkuc  
pcimhmim cyuti tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli fyixre7t hjonli

drutta *Smilacina racemosa* is a PERENNIAL growing to 3 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Fruit - raw, cooked or made into jellies and molasses[2, 46, 55, 85, 102, 183]. The fruit is smaller than a pea but is produced in quite large terminal clusters on the plant and so is easy to harvest. It has a delicious bitter-sweet flavour, suggesting bitter molasses[85, 183]. The fruit is said to store well[207]. It certainly hangs well on the plants and we have picked very delicious fruits in late October[K]. Rich in vitamins[177], the fruit has been used to prevent

scurvy[213]. Some caution is advised since the raw fruit is said to be laxative in large quantities, though this is only if you are not used to eating this fruit[85, 102, 159, 183]. Thorough cooking removes much of this laxative element[183]. Young leaves - raw or cooked[102]. The young shoots, as they emerge in spring, can be cooked and used as an asparagus substitute[55, 85, 102, 159, 183]. Root - cooked[85]. It should be soaked in alkaline water first to get rid of a disagreeable taste[85, 102, 159, 183]. It can be eaten like potatoes or pickled[183].

tcanta Plants can be grown as a ground cover when planted about 45cm apart each way[208].

dwatta False spikenard was widely employed by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. The plant is contraceptive and haemostatic[213, 257]. A decoction is used in the treatment of coughs and the spitting up of blood[257]. Half a cup of leaf tea drunk daily for a week by a woman is said to prevent conception[213, 257]. A poultice of the crushed fresh leaves is applied to bleeding cuts[257]. A tea made from the roots is drunk to regulate menstrual disorders[213]. The root is analgesic, antirheumatic, appetizer, blood purifier, cathartic and tonic[257]. A decoction is said to be a very strong medicine, it is used for treating rheumatism and kidney problems and, when taken several times a day it has been used successfully in treating cancer and heart complaints[257]. The fumes from a burning root have been inhaled to treat headaches and general body pain[257]. The fumes have also been used to restore an unconscious patient and to bring an insane person back to normal[257]. The dried powdered root has been used in treating wounds[213]. A poultice of the root has been applied to the severed umbilical cord of a child in order to speed the healing process and is also used to treat cuts, swellings etc[257]. A cold infusion of the root is used as a wash for sore eyes[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be very slow to germinate, often taking 18 months. Stored seed should be sown in a cold frame as soon as possible, it may take 2 years or longer to germinate. Grow the seedlings on in a shady part of a greenhouse for their first year without pricking them out, giving them liquid or foliar feeds as required to ensure that they do not become nutrient deficient. Divide the young plants up into individual pots in the autumn when they are dormant, and grow them on for at least another year in a shady part of the greenhouse. When the plants have reached a sufficient size, plant them out in the autumn whilst they are dormant. Division in spring or early autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta An easy plant to grow[233], it requires a deep fertile humus rich moisture retentive soil, neutral to slightly acid, that does not dry out in the growing season, and a shady position[200]. Requires a lime-free soil[233]. It does well in a woodland garden[200]. Hardy to about -20°C[200]. Plants take a few years to become established[208]. This species can be separated into two sub-species, *S. racemosa racemosa* being found in the east of the range whilst *S. racemosa amplexicaule* is found in the west[270]. One report says that the plant is apomictic (producing seeds without sexual fusion), though this needs to be investigated further[270]. The flowers have a gentle sweet perfume[245]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.10 Raphanus sativus

Radish, Cultivated radish

2 tin 11 cyuc 4 kcak 0 tcan 3 dwat 0.5 m hkuc  
hmimhtu cyuti tcup hwicli hrasjlutnyik hpa7tli prikewis  
hpa7tmwatli xre7t hjonli

drutta *Raphanus sativus* is a ANNUAL growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for

USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Oil Oil Root Seed Uses: Oil OilYoung leaves - raw or cooked[37, 52, 104, 183]. A somewhat hot taste, and the texture is somewhat coarse[K]. As long as they are young, they make an acceptable addition in small quantities to chopped salads and are a reasonable cooked green[K]. A nutritional analysis is available[218]. Young flower clusters - raw or cooked[183]. A spicy flavour with a crisp pleasant texture, they make a nice addition to salads or can be used as a broccoli substitute[9, K]. Seeds - raw. The seed can be soaked for 12 hours in warm water and then allowed to sprout for about 6 days[244]. They have a hot spicy flavour and go well in salads[183, 244]. Young seedpods - raw[2, 37, 52, 104]. Crisp and juicy with a mildly hot flavour[K]. They must be eaten when young because they quickly become tough and fibrous[183]. Root - raw or cooked[2, 37, 52]. Crisp and juicy, they have a hot and spicy flavour and are a very popular addition to salads[183, K]. The summer crops do not store well and should be used as soon as possible after harvesting[K]. The winter varieties (including the Japanese forms) have much larger roots and often a milder flavour. These store well and can be either harvested in early winter for storage or be harvested as required through the winter[K]. An edible oil is obtained from the seed[2, 183].

**tcanta Fodder Green manure Oil Oil Repellent** The growing plant repels beetles from tomatoes and cucumbers[20, 201]. It is also useful for repelling various other insect pests such as carrot root fly[201]. There is a fodder variety that grows more vigorously and is used as a green manure[87].

**dwatta Anthelmintic Antibacterial Antifungal Antiscorbutic Antispasmodic Appetizer Astringent Cancer Carminative Cholagogue Digestive Diuretic Expectorant Laxative Poulitice Stomachic**Radishes have long been grown as a food crop, but they also have various medicinal actions. The roots stimulate the appetite and digestion, having a tonic and laxative effect upon the intestines and indirectly stimulating the flow of bile[254]. Consuming radish generally results in improved digestion, but some people are sensitive to its acridity and robust action[254]. The plant is used in the treatment of intestinal parasites, though the part of the plant used is not specified[147]. The leaves, seeds and old roots are used in the treatment of asthma and other chest complaints[218]. The juice of the fresh leaves is diuretic and laxative[240]. The seed is carminative, diuretic, expectorant, laxative and stomachic[176, 218, 240]. It is taken internally in the treatment of indigestion, abdominal bloating, wind, acid regurgitation, diarrhoea and bronchitis[238]. The root is antiscorbutic, antispasmodic, astringent, cholagogue, digestive and diuretic[21, 218]. It is crushed and used as a poultice for burns, bruises and smelly feet[218]. Radishes are also an excellent food remedy for stone, gravel and scorbutic conditions[4]. The root is best harvested before the plant flowers[21]. Its use is not recommended if the stomach or intestines are inflamed[21]. The plant contains raphanin, which is antibacterial and antifungal[218, 238]. It inhibits the growth of *Staphylococcus aureus*, *E. coli*, streptococci, *Pneumococci* etc[176]. The plant also shows anti-tumour activity[218].

**propta Seed** - sow outdoors in situ in succession from late winter to the middle of summer. Germination takes place within a few days of sowing the seed. If you want a constant supply of the roots then you need to sow seed every 2 - 3 weeks.

**nwatta** Very easily cultivated fast-growing plants which prefer a rich light soil with ample moisture[16, 52, 264]. They dislike very heavy or acid soils[16, 37]. Plants are susceptible to drought and require irrigation during dry spells in the summer or the root quality will rapidly deteriorate and the plant will go to seed. Radishes are widely cultivated for their edible roots. There are many named varieties[183] that are able to supply edible roots all year round. Over the centuries a number of distinct groups have evolved through cultivation, these have been classified by the botanists as follows. A separate entry has been made for each group:- R.

sativus. The common radish. Fast maturing plants with small roots that can be round or cylindrical and usually have red skins. They are grown primarily for their roots which in some varieties can be ready within three weeks from sowing the seed and are used mainly in salads. These are mainly grown for spring, summer and autumn use and can produce a crop within a few weeks of sowing. R. sativus caudatus. The rat-tailed radishes. This group does not produce roots of good **SeedEdible Parts:** Inactivated mainly for the edible young seedpods which are harvested in the summer. R. sativus niger. The Oriental and Spanish radishes. These are grown for their larger edible root which can be round or cylindrical and can be available throughout the winter. R. sativus oleiformis. The fodder radishes. These are grown mainly for their leaves and oil-rich seeds, they are used as a green manure or stock feed though they can also be eaten by people. The roots of these plants soon become fibrous, though they make acceptable eating when young. Radishes are a good companion plant for lettuces, nasturtiums, peas and chervil, tomatoes and cucumbers[18, 20]. They are said to repel cucumber beetles if planted near cucumber plants and they also repel the vine borers which attack squashes, marrows and courgettes[238]. They grow badly with hyssop[18, 20] and with grape vines[201].

### 3.2.11 Anethum graveolens

Dill

2 tin 11 cyuc 4 kcak 2 tcan 3 dwat 0.8 m hkuc htut cyutli tcup hwicli hraslut hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

**drutta Anethum graveolens** is an ANNUAL growing to 0.8 m (2ft 7in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf from May to November, in flower from April to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves SeedEdible Uses: Condiment TeaLeaves - raw or cooked[2, 4, 9, 14, 21]. Used as a flavouring in salads etc[132, 183]. The leaves lose their flavour if the are cooked for any length of time and so are best used raw or added to cooked dishes only a few minutes before the cooking is complete[244]. The leaves can be harvested at any time the plant is growing, but are best just before the plant flowers[244]. Per 100g, the plant contains 253 calories, 7.2g water, 20g protein, 4.4g fat, 55.8g carbohydrate, 11.9g fibre, 12.6g ash, 1784mg calcium, 543mg phosphorus, 48.8mg iron, 451mg magnesium, 208mg sodium, 3,308mg potassium, 3.3mg zinc, 0.42mg thiamine, 0.28mg riboflavin, 2.8mg niacin and 1.5mg vitamin B6[218]. Seed - raw or cooked. Very pungent and bitter in taste[4]. It is used as a flavouring in salads, preserves etc[2, 7, 9, 21, 46, 183], its chief uses being perhaps in making dill vinegar and as a flavouring in pickled gherkins[4]. It can also be sprouted and used in breads, soups and salad dressings[183]. Per 100g, the seed contains 305 calories, 7.7g water, 14.5g fat (0.73g saturated, 124mg phytosterol and no cholesterol), 55.2g carbohydrate, 21g fibre, 6.7g ash, 1,516mg calcium, 277mg phosphorus, 16.3mg iron, 256mg magnesium, 20mg sodium, 1,186mg potassium, 5.2mg zinc, 53IU vitamin A, 0.42mg thiamine and 0.28mg riboflavin[218]. An essential oil from the seed is used as a flavouring in the food industry[46, 105]. A tea is made from the leaves and/or the seeds[183].

**tcanta Essential Insecticide**The seed contains up to 4% essential oils[244]. It is used in perfuming soaps[4], medicines and as a food flavouring[244]. Some compounds of dill (d-carvone is mentioned as one of them), when added to insecticides, have greatly increased the effectiveness of the insecticides[218].

**dwatta Antihistalitis Aromatic Carminative Diuretic Galactogogue Stimulant Stomachic**Dill has a very long history of herbal use going back more than 2,000 years. The seeds are a common and very effective household remedy for a wide range of digestive problems. An infusion is especially efficacious in treating gripe in babies and flatulence in young children. The seed is aromatic, carminative, mildly diuretic,

decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[213]. The bark is harvested in the spring or early autumn from 3 - 6 year old branches and is dried for later use[7, 9]. The leaves are used internally in the treatment of minor feverish illnesses and colic[238]. An infusion of the leaves has a calming effect and is helpful in the treatment of nervous insomnia[7]. When added to the bath water, the infusion is of real benefit in relieving widespread rheumatism[7]. The leaves can be harvested throughout the growing season and are used fresh or dried[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Salix* / Willow for diseases accompanied by fever, rheumatic ailments, headaches (see [302] for critics of commission E).

**propta Seed** - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Branches of older wood as long as 2.5 metres can be used[1]. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

**nwatta** A very easily grown plant, it succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200] and dislikes poor thin soils[186]. Very tolerant of maritime exposure and atmospheric pollution[75, 186]. Trees respond well to coppicing or pollarding[186]. Best planted into its permanent position as soon as possible, trees respond badly to transplanting unless they are moved regularly. The root system is rather aggressive and can cause problems with drains[200]. A very important food plant for the caterpillars of many species of butterflies[30] and a good bee plant, providing an early source of nectar and pollen[11]. A very good wildlife habitat, more than 200 species of insects are associated with this tree[24]. There are many sub-species and cultivars in this species[182]. *S. alba caerulea* is the cricket bat willow, cultivated for its wood[11, 131]. *S. alba vitellina*. (L.)Stokes. has been cultivated for its very tough stems that are used as the rods in basket making[123, 131]. The cultivar 'Cardinal' is also grown for its use in basket making[131]. This species is used commercially in papermaking[189]. Hybridizes freely with other members of this genus, especially *S. fragilis*, to which it is closely related[11]. Trees cast a relatively light shade. Dioecious. Male and female plants must be grown if seed is required. Special Features: Attractive foliage, Not North American native, Wetlands plant, Inconspicuous flowers or blooms.

### 3.2.50 Linnaea borealis

Twinflower, Longtube twinflower

2 tin 6 cyuc 1 kcak 2 tcan 1 dwat 0.2 m hkuc pcmhmim cyutli tcup hwicli hraslutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

**drutta Linnaea borealis** is an evergreen Shrub growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** LeavesEdible Uses: A food plant[177, 257]. No more details are given.

**tcanta** The plant forms an extensive twiggly mat and is useful as a ground cover on peat beds and in rock gardens[188]. Plants form a dense carpet when growing in god conditions, rooting as they spread, but otherwise the cover is sparse[208]. Plants should be spaced about 60cm apart each way[208].

**dwatta Poulitice Women's complaints**The plant has been used as a tonic in pregnancy and also in the treatment of painful or difficult menstruation[222]. The mashed plant is used as a poultice on inflamed limbs and is also applied to the head to ease the pain of headaches[257].

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame[188]. Sow stored seed as soon as possible, it is likely to require a period of cold stratification. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of rooted runners in the spring[188]. Layering. Cuttings of half-ripe wood in the summer[188]. They are rather slow to root[1].

**nwatta Landscape Uses:**Ground cover, Rock garden, Woodland garden. Prefers a rather shaded position in a rock garden in a moist peaty soil[11, 200]. It grows well in pine woods[245]. Requires an acid soil[200]. Plants can be rather difficult to establish[200]. The sub-species *L. borealis americana* grows more freely than the European form. The plant is polymorphic[1]. The flowers have an evening fragrance like that of the honeysuckle[245]. Special Features:North American native, Fragrant flowers. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 3.2.51 Salix cinerea

Grey Willow, Large gray willow

2 tin 7 cyuc 0 kcak 3 tcan 3 dwat 5 m hkuc htut cyutli tcuphja7n hwicli hraslutnyikfrp hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

**drutta Salix cinerea** is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from March to April, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta None known**

**tcanta Pioneer Soil stabilization**Landscape Uses: Border, Massing, Specimen. Plants have an extensive root system and are used to stabilize waste tips and old slag heaps[199]. The seeds are very light and so can travel some distance in the wind. The plant is therefore able to find its way to areas such as cleared woodland where the soil has been disturbed. Seedlings will grow away quickly, even in exposed conditions and the plant will provide good shelter for the establishment of woodland plants. Thus it makes a good pioneer species and, except in wetter and moorland-type soils, will eventually be largely out-competed by the other woodland trees. Its main disadvantage as a pioneer plant is that it has an extensive root system and is quite a greedy plant, thus it will not help as much in enriching the soil for the other woodland plants as other pioneer species such as the alders, *Alnus* species[K]. Special Features: Not North American native, Wetlands plant, Attractive flowers or blooms. Dynamic accumulator.

**dwatta Anodyne Dysentery Febrifuge**The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and



229]. The bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238]. An infusion of the bark and leaves has been used to wet a cloth which is then tied around the head as a treatment for headaches[257]. The infusion has also been used as a wash on cuts, bruises, wounds and insect stings[257]. A poultice of the boiled bark and leaves has been used to treat swellings caused by muscle strain[257].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta Landscape Uses:Aggressive surface roots possible. An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circumneutral soil, growing best in the south and east of Britain[11, 200]. Tolerates extremely alkaline soils[200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It does not do well in exposed upland sites[11]. It dislikes shade and is intolerant of root or branch competition[200]. A fast-growing but short-lived species[229]. Some forms of this species are tender in Britain[11]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200]. Special Features: North American native, Wetlands plant, Inconspicuous flowers or blooms.

### 3.2.48 Sorbaria sorbifolia

false spiraea  
2 tin 7 cyuc 1 kcaok 0 tcan 0 dwat 1.8 m hkuc  
hmimhmtt cyutli tcup hwicli hrasljutnykrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Sorbaria sorbifolia is a deciduous Shrub growing to 1.8 m (6ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

ckakta Edible Parts: LeavesEdible Uses: Budlings and leaves - cooked[105]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers in the dormant season[188]. Root cuttings in late winter[188].

nwatta Landscape Uses:Border, Erosion control, Massing, Screen, Specimen, Woodland garden. Prefers a rich moist soil[11], but succeeds in any soil of good quality in full sunshine[1]. Tolerates dappled shade[200] but prefers

a sunny position[188]. Requires protection from strong winds[200]. Tolerates atmospheric pollution[200]. A freely suckering shrub forming low thickets, it grows well in light woodland[182, 200]. Make sure you have the space for this plant since it can become invasive[200]. The flowers are generous with their sweet perfume whatever the weather[245]. They hold their fragrance for a considerable time[245]. Special Features:Not North American native, Attractive flowers or blooms.

### 3.2.49 Salix alba

White Willow  
2 tin 8 cyuc 1 kcaok 4 tcan 3 dwat 25 m hkuc  
htut cyutli tcuphja7n hwicli hrasljutnykrip hpa7tli flatprik hpa7tmwatli nyanjhonli

drutta Salix alba is a deciduous Tree growing to 25 m (82ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from April to May, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

ckakta Edible Parts: Inner bark LeavesEdible Uses: TeaInner bark - raw or cooked. It can be dried, ground into a powder and added to cereal flour then used in making bread etc[2]. A very bitter flavour, especially when fresh[2, 115], it is used as a famine food when all else fails[172]. Leaves and young shoots - raw or cooked[2, 177]. Not very palatable[172]. They are used only in times of scarcity[105]. The leaves can be used as a tea substitute[61].

tcanta Basketry Charcoal Paper Pioneer Shelterbelt String WoodLandscape Uses: Aggressive surface roots possible, Pollard, Specimen. The young stems are very flexible and are used in basket making[13, 46, 61]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The bark can be used for tying plants[61]. A fibre obtained from the stems is used in making paper[189]. The stems are harvested in spring or summer, the leaves are removed and the stems steamed until the fibres can be stripped. The fibres are cooked for 2 hours with lye and then beaten with mallets or put through a blender. The paper is red/brown in colour[189]. A fast growing tree and tolerant of maritime exposure, it can be grown as a shelterbelt[75]. The plant's rapid growth and wind tolerance make it a very good pioneer species to use in establishing woodland conditions in difficult sites. Spacing cuttings about every 5 metres will soon provide shelter and a suitable environment for planting out woodland trees that are not so wind tolerant. The main disadvantage in using this species is that the roots are far-ranging and the plant is quite greedy, so it will not as much effect as species such as the alders (Alnus species) in enriching the soil and thus feeding the woodland plants[K]. Wood - elastic, soft, easy to split, does not splinter. Used for construction, turnery, poles, tool handles etc[11, 46, 61]. The wood is also used to make charcoal[11], which has medicinal uses[7]. Dynamic accumulator.

dwatta Anodyne Antiinflammatory Antiperiodic Antirheumatic Antiseptic Astringent Diaphoretic Diuretic Dysentery Febrifuge Hypnotic Sedative TonicJustly famous as the original source of salicylic acid (the precursor of aspirin), white willow and several closely related species have been used for thousands of years to relieve joint pain and manage fevers[254]. The bark is anodyne, anti-inflammatory, antiperiodic, antiseptic, astringent, diaphoretic, diuretic, febrifuge, hypnotic, sedative and tonic[4, 7, 9, 21, 165]. It has been used internally in the treatment of dyspepsia connected with debility of the digestive organs[4], rheumatism, arthritis, gout, inflammatory stages of auto-immune diseases, feverish illnesses, neuralgia and headache[238]. Its tonic and astringent properties render it useful in convalescence from acute diseases, in treating worms, chronic dysentery and diarrhoea[4]. The fresh bark is very bitter and astringent[222]. It contains salicin, which probably

galactagogue, stimulant and stomachic[4, 21, 46, 165]. It is also used in the form of an extracted essential oil[243]. Used either in an infusion, or by eating the seed whole, the essential oil in the seed relieves intestinal spasms and griping, helping to settle colic[254]. Chewing the seed improves bad breath[254]. Dill is also a useful addition to cough, cold and flu remedies, it can be used with antispasmodics such as Viburnum opulus to relieve period pains[254]. Dill will also help to increase the flow of milk in nursing mothers and will then be taken by the baby in the milk to help prevent colic[254].

propta Seed - sow April to early summer in situ and only just cover[200, 238]. The seed germinates in 2 weeks if the soil is warm. A regular supply of leaves can be obtained if successional sowings are made from May to the end of June[89, 200]. Autumn sowings can succeed if the winters are mild[4]. Dill is very intolerant of root disturbance and should not be transplanted because it will then quickly run to seed.

nwatta Landscape Uses:Border, Container. An easily grown plant[4], it prefers a moderately rich loose soil and full sun[14, 27, 88]. Requires a well-drained soil[27] and shelter from the wind[200]. Tolerates a pH in the range 5.3 to 7.8. Dill is a commonly cultivated herb, especially in warm temperate and tropical zones. It is grown mainly for its edible leaves and seeds, though it is also used medicinally. There are many named varieties[142, 183]. 'Bouquet' is an American cultivar that has a prolific production of seeds[238]. The sub-species A. graveolens sowa from India has a slightly different flavour to the type species[238]. The plant quickly runs to seed in dry weather[200]. It often self-sows when growing in a suitable position[37, 88]. A good companion for corn and cabbages, also in moderation for cucumbers, lettuce and onions, but it inhibits the growth of carrots[14, 18, 20]. Dill reduces a carrot crop if it is grown to maturity near them[201]. However, the young plant will help to deter carrot root fly[201]. The flowers are very attractive to bees[14, 18, 20]. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

### 3.2.12 Coriandrum sativum

Coriander - Dhania - Cilantro, Coriander  
2 tin 11 cyuc 4 kcaok 4 tcan 4 dwat 0.5 m hkuc  
hmimhmtt cyutli kyucput hwicli hrasljut hpa7tli flatprikliw wisslip hpa7tmwatli fyfjre7t hjonli

drutta Coriandrum sativum is a ANNUAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

ckakta Edible Parts: Leaves Oil SeedEdible Uses: Condiment OilLeaves - raw or cooked. They are used as a flavouring in salads, soups etc[2, 4, 21, 37, 61] and the fresh leaves are probably the most widely used flavouring herb in the world[268]. The leaves have an aromatic flavour[183]. It is foetid according to another report[4], whilst another says that the fresh leaves have a strong bedbug-like smell[244]. The leaves should not be eaten in large quantities[132]. The fresh leaves contain about 0.012% oxalic acid and 0.172% calcium[240]. Seed - cooked. It is used as a flavouring in many dishes including cakes, bread and curries, it is also widely used to flavour certain alcoholic liquors[2, 4, 5, 21, 27, 37]. The fresh seed has a disagreeable and nauseous smell, but when dried it becomes fragrant, the longer it is kept the more fragrant it becomes[4, 132]. Plants yield about 1¼ tonnes per acre of seed[4]. The root is powdered and used as a condiment[161]. An essential oil from the seed is used as a food flavouring[21, 46, 61, 105]

tcanta Essential Fuel Fungicide Insecticide Oil RepellentAn essential oil from the seed is used as a food flavouring, in perfumery, soap making etc[21, 46, 61, 74, 105]. It is also fungicidal and bactericidal[238]. The growing plant

repels aphids[14, 20, 201]. A spray made by boiling of one part coriander leaves and one part anise seeds in two parts of water is very effective against red spider mites and woolly aphids[201]. An oil from the seed is used for making soap[74]. The report does not make it clear if the essential oil or the fixed oil is used[K]. The seed contains about 20% fixed oil[240], this has potential for industrial use in Britain, it could become an alternative to oilseed rape though the oil content is a bit on the low side at present (1995). The oil can be split into two basic types, one is used in making soaps etc, whilst the other can be used in making plastics[234]. The dried stems are used as a fuel[74].

dwatta Antidiarrhoeal Antihalitosis Appetizer Aromatherapy Aromatic Carmine Carminative Depurative Expectorant Narcotic Stimulant StomachicCoriander is a commonly used domestic remedy, valued especially for its effect on the digestive system, treating flatulence, diarrhoea and colic[9, 244]. It settles spasms in the gut and counters the effects of nervous tension[254]. The seed is aromatic, carminative, expectorant, narcotic, stimulant and stomachic[4, 9, 21, 46, 147, 178, 201, 238]. It is most often used with active purgatives in order to disguise their flavour and combat their tendency to cause gripe[4, 244]. The raw seed is chewed to stimulate the flow of gastric juices and to cure foul breath[240, 268] and will sweeten the breath after garlic has been eaten[254]. Some caution is advised, however, because if used too freely the seeds become narcotic[4]. Externally the seeds have been used as a lotion or have been bruised and used as a poultice to treat rheumatic joints[254, 268]. The essential oil is used in aromatherapy. Its keyword is 'Appetite stimulant'[210]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Coriandrum sativum (Coriander - Dhania) for dyspepsia, loss of appetite (see [302] for critics of commission E).

propta Seed - sow April in situ[1, 37]. The seed is slow to germinate and so on a garden scale it can also be sown in March in a cold frame. Sow a few seeds in each pot and then plant them out when they are growing away strongly in May[4]. The seed can also be sown in situ in the autumn[1]. Autumn sown plants will grow bigger and produce more seed.

nwatta Prefers a warm dry light soil[4, 27, 37]. Plants grown mainly for their seeds do well in partial shade, but when growing for the seed or essential oil a sunny position is preferred[238]. The plants dislike constant moisture[14] or too much nitrogen[200]. Another report says that coriander grows best when a cool damp spring is followed by a hot dry summer[238]. Coriander tends to run quickly to seed if the plants are too dry at the seedling stage[238]. Plants tolerate a pH in the range 4.9 to 8.3. Coriander is often cultivated, both on a garden scale and commercially, for its edible seed[4, 142], there are some named varieties[183]. The plant is fast-growing, ripening its seed without difficulty in Britain and it seems to be free of pests and diseases[234]. The seeds have been used medicinally and as a food flavouring since ancient times, and were introduced into Britain by the Romans[244]. In the Middle Ages they were added to love potions because of their reputation as aphrodisiacs[244]. The plants flowers are very attractive to pollinating insects[14, 18, 201]. Coriander is in general a good companion plant in the garden, helping to repel aphid and carrot root fly[238]. It grows well with anise, improving the germination rate when the two species are sown together[14, 18, 20, 238], but it grows badly with fennel, where it acts to reduce the seed yield of the fennel[14, 18, 20, 201, 238]. Coriander also grows particularly well with dill and chervil[201].

### 3.2.13 Cucurbita pepo

Pumpkin, Field pumpkin, Ozark melon, Texas gourd  
2 tin 11 cyuc 4 kcaok 2 tcan 3 dwat 0.6 m hkuc  
hmimhmtt cyutli tcup hwicli hrasljutnykrip hpa7tli flatprikliw hpa7tmwatli fyf hjonli

drutta Cucurbita pepo is a ANNUAL CLIMBER growing to 0.6 m (2ft) by 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium

(loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Fruit Leaves Oil Oil Root Uses: Oil OilFruit - cooked[2, 27, 46, 105]. Used as a vegetable, it has a very mild flavour and is very watery[K]. It is often harvested when still very young when it is called courgettes. The fruit has very little flavour of its own and so is often used as a base for making savoury dishes, the seeds being scooped out of the fruit and a filling being put in its place - this can then be baked[K]. A nutritional analysis is available[218]. Seed - raw or cooked[57, 86, 183]. The seed can also be ground into a powder and mixed with cereals for making bread etc[183]. Rich in oil with a pleasant nutty flavour but very fatty to use because the seed is small and covered with a fibrous coat[K]. A nutritional analysis is available[218]. The seeds can also be sprouted and used in salads etc[183]. Some caution is advised here, see notes above on toxicity. An edible oil is obtained from the seed[46, 105, 117, 183]. Leaves and young stems - cooked as a potherb[135, 183]. A nutritional analysis is available[218]. Flowers and flower buds - cooked or dried for later use[135, 183]. A nutritional analysis is available[218]. Root - cooked[179]. We have some doubts on this report[K].

**tcanta Miscellany Oil Oil**The seed contains 34 - 54% of a semi-drying oil. Used for lighting[46].

**dwatta Anthelmintic Miscellany Poulitice Urinary**The pumpkin has been much used as a medicine in Central and North America. It is a gentle and safe remedy for a number of complaints, especially as an effective tapeworm remover for children and pregnant women for whom stronger acting and toxic remedies are unsuitable[254]. The seeds are mildly diuretic and vermifuge[7, 88, 254]. The complete seed, together with the husk, is used to remove tapeworms. The seed is ground into a fine flour, then made into an emulsion with water and eaten. It is then necessary to take a purgative afterwards in order to expel the tapeworms or other parasites from the body[7]. As a remedy for internal parasites, the seeds are less potent than the root of *Dryopteris felix-mas*, but they are safer for pregnant women, debilitated patients and children[238]. The seed is used to treat hypertrophy of the prostate[218]. The seed is high in zinc and has been used successfully in the early stages of prostate problems[254]. The diuretic action has been used in the treatment of nephritis and other problems of the urinary system[254]. The leaves are applied externally to burns[240]. The sap of the plant and the pulp of the fruit can also be used[254]. The fruit pulp is used as a decoction to relieve intestinal inflammation[254].

**propta Seed** - sow April in a greenhouse in a rich soil. Germination should take place within 2 weeks. Sow 2 or 3 seeds per pot and thin out to the best plant. The seed requires a minimum temperature of 13°C to germinate[200]. Grow them on fast and plant out after the last expected frosts, giving them cloche or frame protection for at least their first few weeks outdoors until they are growing strongly.

**nwatta** Requires a rich, well-drained moisture retentive soil and a very warm, sunny and sheltered position[1, 16, 37, 86]. Prefers a pH of 5.5 to 5.9, but tolerates up to 6.8[86]. Plants are tolerant of light shade[86] (This comment is probably more applicable to warmer climates than Britain[K]). A frost-tender annual plant, the pumpkin or marrow is widely cultivated in temperate and tropical zones for its edible fruit. It has long been grown as a domestic plant and a number of different groups have been developed. Botanists have tried to classify these groups, though there is considerable overlap and clear distinctions are not always possible. Since they are very similar in their cultivation needs, we have treated all the groups together in this entry. The botanists classification is as follows:- *C. pepo* pepo. This includes the vegetable marrows, zucchinis, pumpkins and ornamental gourds. There are many named varieties and these can vary considerably in size, shape and flavour[27, 183, 200]. The cultivars with larger and rounder fruits are usually called pumpkins, the fruits are harvested in the autumn and can be stored for a few months. The marrows are smaller than pumpkins and generally sausage-shaped. These can also be harvested in the autumn and stored for a few months, but it is more usual to eat them whilst they are still very small, when they are known as courgettes. Harvesting the fruits of the marrows when very small stimulates the plant into making more flowers (and hence fruits) so it can be a very productive way of

using the plant. Pumpkins and marrows succeed outdoors most summers in Britain[27], in fact many of these varieties are well adapted to cool growing conditions and therefore do well in the British climate[200]. *C. pepo pepo fraterna*. This is a probable progenitor of the marrows and so is of potential value in any breeding programmes. *C. pepo ovifera*. This group includes various summer squashes including the acorn, crookneck and patty pan squashes. *C. pepo ovifera ozarkana*. A probable ancestor of the summer squashes, it could be of value in breeding programmes. *C. pepo texana*. The Texas gourd, or wild marrow, is another form that could be of value in breeding programmes. Plants produce both male and female flowers. These are insect pollinated but in cool weather it is worthwhile hand pollinating[200]. Most cultivars are day-length neutral and so are able to flower and fruit throughout the British summer[200]. A fast-growing plant, trailing forms can be used to provide a summer screen[86]. This species does not hybridize naturally with other edible members of this genus[135]. Squashes and pumpkins can be differentiated from each other by their fruit stalk, it is angular and polygonal in pumpkins but thick, soft and round in squashes[132]. Pumpkins grow well with sweet-corn and thornapple but they dislike growing near potatoes[18, 20, 201]. They also grow well with nasturtiums, mint, beans and radishes[201].

### 3.2.14 Raphanus sativus niger

Oriental Radish

2 tlin 11 cyuc 4 kcak 3 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrsajlutnyik hpa7tli prikliws hpa7tmwatli xre7t hjonli

**drutta** Raphanus sativus niger is an ANNUAL growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Oil Root Seed S Uses: OilYoung leaves - raw or cooked[37, 52, 104, 183]. A somewhat hot taste, and the texture is somewhat coarse[K]. As long as they are young, they make an acceptable addition in small quantities to chopped salads and are a reasonable cooked green[K]. A nutritional analysis is available[218]. Young flower clusters - raw or cooked[183]. A spicy flavour with a crisp pleasant texture, they make a nice addition to salads or can be used as a broccoli substitute[9, K]. Seeds - raw. The seed can be soaked for 12 hours in warm water and then allowed to sprout for about 6 days[244]. They have a hot spicy flavour and go well in salads[183, 244]. Young seedpods - raw[2, 37, 52, 104]. Crisp and juicy with a mildly hot flavour[K]. They must be eaten when young because they quickly become tough and fibrous[183]. Root - raw or cooked[2, 37, 52]. Large, crisp and juicy, many varieties have a hot and spicy flavour, though there are also many of the Oriental forms with much milder flavours. They can be sliced and eaten in salads or can be cooked in soups etc. The roots store well and can be either harvested in early winter for storage or be harvested as required through the winter[K]. An edible oil is obtained from the seed[2, 183].

**tcanta Fodder Green manure Oil Repellent**The growing plant repels beetles from tomatoes and cucumbers[20, 201]. It is also useful for repelling various other insect pests such as carrot root fly[201]. There is a fodder variety that grows more vigorously and is used as a green manure[87].

**dwatta Anthelmintic Antibacterial Antifungal Antisporobutic Antispasmodic Astringent Cancer Carminative Cholagogue Digestive Diuretic Expectorant Laxative Poulitice StomachicRadishes** have long been grown as a food crop, but they also have various medicinal actions. The roots stimulate the appetite and digestion, having a tonic and laxative effect upon the intestines and indirectly stimulating the flow of bile[254]. Consuming radish generally results in improved digestion, but some people are sensitive to its acidity and robust action[254]. The plant is used in the treatment of intestinal parasites, though the part of the plant used is not specified[147]. The leaves, seeds and old roots are used in

ture, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 3.2.46 Pinus mugo

Dwarf Mountain Pine, Mugo pine, Mountain Pine

2 tlin 7 cyuc 1 kcak 0 tcan 2 dwat m hkuc htut cyutli hgatkycutup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

**drutta** Pinus mugo is an evergreen Tree growing to 4.5 m (14ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower in June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Edible Uses: CondimentA vanilla flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

**tcanta Dye Essential Herbicide Shelterbelt Soil stabilization WoodA tan or green dye** is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Trees are sometimes planted as a shelterbelt at high altitudes[185]. There are a number of dwarf forms that are very useful for covering dry slopes and mounds[11]. An essential oil obtained from the young twigs is used medicinally and also in woody perfumeries[7, 46, 61]. Trees are planted for sand binding and shelter in N. Europe[50]. Oleoresins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - used to make shoes etc[46, 61].

**dwatta Antiasthmatic Balsamic Cardiotoxic Expecto-rant**The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. The apical branches are antiasthmatic, balsamic, cardiotoxic and expectorant[7, 61]. When distilled, the leaves and branches yield an essential oil that is commonly used in pharmaceutical balsamic preparations because of its antiseptic and expectorant qualities[7]. It is used internally and externally in the treatment of upper respiratory tract infections, chronic bronchitis, catarrh and

asthma[238]. It is used externally to treat rheumatism and muscular stiffness[238].

**propta** It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

**nwatta Landscape Uses:**Border, Christmas tree, Pest tolerant, Screen, Seashore, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Thrives in the poorest of soils[11, 200]. Tolerates strong winds[81], including maritime exposure[200]. A polymorphic species, there are many named varieties[11]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. There are some named forms selected for their ornamental value[188]. Unlike most species of pine, this tree transplants well[11]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Fragrant foliage, Not North American native, Inconspicuous flowers or blooms.

### 3.2.47 Populus fremontii

Cottonwood, Fremont cottonwood, Fremont Poplar, Western Cottonwood

2 tlin 9 cyuc 1 kcak 3 tcan 2 dwat 25 m hkuc htut cyutli kyucutup hwicli hrsajlutnyikrip hpa7tli flatprikli-wwisslip hpa7tmwatli nyanhjen hjonli

**drutta** Populus fremontii is a deciduous Tree growing to 25 m (82ft 0in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from March to April, and the seeds ripen in April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Inner barkEdible Uses: GumCatkins - raw or cooked[106, 229]. Eaten as a snack[257]. The young green seedpods have been chewed as a gum[257]. Inner bark[106]. There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread.

**tcanta Basketry Fuel Gum Rooting hormone WoodStrips** of the inner bark have been used in garments[229]. This report does not make clear if this was merely for ornament, or whether the bark had a functional use[K]. An extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. The young twigs are peeled and split then used in basket making[61, 229, 257]. Wood - soft, weak, light, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11, 229]. Used locally for fence posts, the trees are also frequently pollarded for fuel[82, 229].

**dwatta Anodyne Antiinflammatory Antiscorbic**FebrifugeThe inner bark was consumed by various native North American Indian tribes in order to prevent scurvy[61,

### 3.2.44 *Convallaria majalis*

Lily Of The Valley, European lily of the valley  
2 tin 7 cyuc 1 kcaak 3 tcan 3 dwat m hkuic  
pcimhmimhtu cyuti kyuctucphja7n hwicli hyishrasjlutnykfr  
rip hpa7tli flatprklwis hpa7tmwatli fyifxre7t hjonli

drutta *Convallaria majalis* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

kcakta A wine can be prepared from the flowers, mixed with raisins[183].

tcanta Dye EssentialAn essential oil is obtained from the flowers[46, 171]. It is used in perfumery and for snuff[238]. A green dye is obtained from the leaves in spring[13, 14, 115]. A yellow dye is obtained from the leaves in autumn[14]. Plants can be grown as a ground cover in woodland shade or in a shrubbery[200, 208]. As a garden ornamental it has gained the Royal Horticultural Society's Award of Garden Merit.

dwatta Antianxiety Antiarrhythmic Anticonvulsant Antispasmodic Cardiotonic Diuretic Emetic Fibrifuge Laxative Poultice SedativeLily of the valley has a long and proven reputation in herbal medicine in the treatment of heart complaints. It contains the glycosides convallarin and convallamarin which are powerful cardiac tonics and diuretics and are also used in allopathic medicine[244]. However, because of the plants potential toxic properties it should never be used without expert advice[9]. All parts of the plant are antispasmodic, cardiotonic, strongly diuretic, emetic, fibrifuge, laxative and sedative[4, 7, 9, 21, 46, 165, 222, 254]. The plant is usually harvested when in flower and can be dried for later use[4], though it is stronger acting when fresh[238]. The inflorescence is said to be the most active medicinally and is often harvested separately[4]. An infusion of the flowers and roots is a digitalis substitute (obtained from Digitalis species), though less powerful, that is especially useful in the treatment of valvula heart diseases, cardiac debility, dropsy and chronic lung problems such as emphysema[4, 222, 254]. Lily of the valley encourages the heart to beat more slowly, regularly and efficiently, at the same time it is strongly diuretic, reducing blood volume and lowering blood pressure[254]. Its effect is less cumulative than digitalis which makes it safer for elderly patients[238]. It is often prescribed combined with the fruits of *Crataegus* spp[238]. An ointment made from the roots is used in the treatment of burns and to prevent scar tissue[222]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Convallaria majalis* : Lily Of The Valley for arrhythmia, cardiac insufficiency, nervous heart complaints (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe, otherwise in late winter, in a cold frame[164]. Germination, particularly of stored seed can be very slow, taking 2 - 12 months or more at 15°C[164]. Sow the seed thinly so that the seedlings can be allowed to grow on undisturbed in the pot for their first year. Apply a liquid feed during the growing season to ensure that the seedlings are well fed. Divide the young plants into individual pots when they die down in late summer and grow them on in pots in a shady position in a cold frame for at least another year before planting them out into their permanent positions when they are dormant[K]. Division in September[111]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Erosion control, Ground cover, Massing, Specimen, Woodland, garden Succeeds in almost any situation, including the dense dry shade of large trees[1, 4, 24]. Prefers a position in semi-shade on a moderately fertile well-drained moist woodland soil[200, 208]. Grows well in heavy clay, sand or chalky soils[208]. Dislikes pure clay soils and boggy sites[233]. Plants are hardy to -20°C or lower[200]. A polymorphic

species[200]. It is a very ornamental plant, though it can become very invasive once it is established[28]. Plants can take a couple of years to become established[208]. There are several named varieties, selected for their ornamental value[233]. The flowers are sweetly scented[245]. Lily of the valley is occasionally cultivated as a medicinal plant for herbalists and allopaths. Plants seem to be immune to the predations of rabbits[233]. A good bee plant[4]. Special Features: Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers, Fragrant flowers.

### 3.2.45 *Sorbus americana*

American Mountain Ash

2 tin 6 cyuc 1 kcaak 2 tcan 2 dwat 10 m hkuic  
hmimhtu cyuti tcup hwicli hyishrasjlutnyk hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Sorbus americana* is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[62, 101]. Rich in iron and vitamin C[213, 226]. The fruit is used mainly in making pies, preserves etc, but it can also be eaten raw after a frost because it turns sweeter then[101, 183]. The fruit has a high tannin content and so should only be used in moderation if eaten raw[226]. It can also be dried and ground into a meal[226]. The fruit is produced in dense clusters and is up to 8mm in diameter[200].  
tcanta Miscellany WoodWood - soft, light, close grained, with little strength[82, 229, 235]. It weighs about 34lb per cubic foot[235] and is of no commercial value[229].

dwatta Antiscorbatic Antiseptic Appetizer Astringent Blood purifier Digestive Diuretic Laxative Miscellany Vitamin CThe inner bark has astringent and antiseptic properties[213]. It is also used as a blood purifier and appetite stimulant[257]. An infusion is used (sometimes with the terminal buds added) in the treatment of colds, debility, diarrhoea etc[222, 257]. When mixed with sweet flag (*Acorus calamus*) it is used as a tonic[257]. A poultice of the burnt bark has been used in the treatment of boils[257]. The fruit is antiscorbatic, diuretic, mildly laxative, astringent and digestive[226, 257]. It is an ideal accompaniment for foods that are hard to digest[226]. A tea from the berries is antiscorbatic and astringent[213, 222]. It has been used as a rectal wash for piles[213]. It is also used in homeopathic remedies[46, 82].

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Landscape Uses:Specimen. Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates partial shade[188], though it fruits better in a sunny position[K]. Dislikes dry soils[188]. Able to succeed in poor soils and to become established on exposed open ground[229]. A slow-growing and relatively short-lived tree in the wild[229], it fruits freely in Britain[11]. Plants are susceptible to firelight[188]. Special Features:Attracts birds, North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this tempera-

the treatment of asthma and other chest complaints[218]. The juice of the fresh leaves is diuretic and laxative[240]. The seed is carminative, diuretic, expectorant, laxative and stomachic[176, 218, 240]. It is taken internally in the treatment of indigestion, abdominal bloating, wind, acid regurgitation, diarrhoea and bronchitis[238]. The root is antiscorbatic, antispasmodic, astringent, cholagogue, digestive and diuretic[21, 218]. It is crushed and used as a poultice for burns, bruises and smelly feet[218]. Radishes are also an excellent food remedy for stone, gravel and scorbutic conditions[4]. The root is best harvested before the plant flowers[21]. Its use is not recommended if the stomach or intestines are inflamed[21]. The plant contains raphanin, which is antibacterial and antifungal[218, 238]. It inhibits the growth of *Staphylococcus aureus*, *E. coli*, streptococci, *Pneumococci* etc[176]. The plant also shows anti-tumour activity[218].

propta Seed - sow outdoors in situ from spring to late summer. Most cultivars are best sown in late summer in order to provide a crop in the winter and early spring, though there are several cultivars that can be successfully sown in the spring to provide a summer and autumn crop.

nwatta Prefers a rich soil with ample moisture[16, 52]. Dislikes very heavy or acid soils[16, 37]. Some of the Oriental radish cultivars have been selected for growing in clay soils, the swollen part of the root is formed on the soil surface[206]. Plants are susceptible to drought and require irrigation during dry spells in the summer or the root quality will rapidly deteriorate and the plant will go to seed. The Oriental and winter radishes are often cultivated for their large edible roots, which can be available from mid summer and all through the winter. There are many named varieties. The plants are very winter hardy and can normally be left in the ground all winter to be harvested as required, though slugs might cause some damage to the roots. Radishes are a good companion plant for lettuces, nasturtiums, peas and chervil, tomatoes and cucumbers[18, 20]. They are said to repel cucumber beetles if planted near cucumber plants and they also repel the vine borers which attack squashes, marrows and courgettes[238]. They grow badly with hyssop[18, 20] and with grape vines[201].

### 3.2.15 *Cornus canadensis*

Creeping Dogwood, Bunchberry dogwood, Bunchberry  
2 tin 7 cyuc 4 kcaak 2 tcan 2 dwat 0.3 m hkuic  
hmimhtu cyuti tcup hwicli hrsajlutnykfrrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Cornus canadensis* is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Pectin PectinFruit - raw or cooked[1, 101]. Pleasant but without much flavour[2, 55, 62]. The fruits are rather dry a bit gummy and rather mealy but they have a pleasant slightly sweet flavour, though they are not the type of fruit I would like to eat raw in quantity[K]. They can be added to breakfast cereals or used for making jams, pies, puddings etc[183]. An excellent ingredient for steamed plum puddings[183]. High in pectin[172], so it can be used with pectin-low fruits when making jam[K]. Pectin is said to protect the body against radiation[201]. The fruit is about 6mm in diameter[200] and is borne in small clusters on top of the plants[K].

tcanta Pectin PectinThe fruit is rich in pectin[172]. A good dense ground cover plant, growing well in light woodland[28, 208]. It takes a little while to settle down and needs weeding for the first few years[197] but becomes rampant when established and can then spread 60 - 90cm per year[208].

dwatta Analgesic Cathartic Febrifuge Kidney OphthalmicThe leaves and stems are analgesic, cathartic and febrifuge[257]. A tea has been used in the treatment of aches and pains, kidney and lung ailments, coughs, fevers etc[222]. A strong decoction has been used as an eye wash[222, 257]. The fruits are rich in pectin which is a capillary tonic, antioedemic, anti-inflammatory, antispasmodic and hypoten-

sive[218]. Pectin also inhibits carcinogenesis and protects against radiation[218]. A tea made from the roots has been used to treat infant colic[222]. The mashed roots have been strained through a clean cloth and the liquid used as an eye-wash for sore eyes and to remove foreign objects from the eyes[257].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Division in spring. This plant can be a bit temperamental when it is being divided. We have found it best to tease out small divisions from the sides of the clump, to avoid the need to disturb the main clump by digging it up. Try to ensure that each division has already produced some roots. Pot them up in light shade in a greenhouse and make sure that they are not allowed to become dry. Once they are rooting and growing away well, which might take 12 months, they can be planted out into their permanent positions.

nwatta Landscape Uses:Rock garden, Specimen, Woodland garden. Succeeds in any soil of good or moderate fertility[1]. Easily grown in a peaty soil in shade or partial shade[187]. Grows well in heavy clay soils. Grows best in sandy soils[208]. Prefers a damp soil[1]. Not suitable for alkaline soils[28, 188]. A very ornamental plant[1], it grows well with heathers[187]. Special Features:Attracts birds, Attractive foliage, North American native, Wetlands plant. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone, 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 3.2.16 *Cucurbita argyrosperma*

Cushaw Pumpkin  
2 tin 11 cyuc 4 kcaak 1 tcan 2 dwat 0.5 m hkuic  
hmimhtu cyuti tcup hwicli hrsajlutnyk hpa7tli flatprklwis hpa7tmwatli fyif hjonli

drutta *Cucurbita argyrosperma* is an ANNUAL CLIMBER growing to 0.5 m (1ft 8in) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit Leaves Oil SeedEdible Uses: OilFruit - cooked[1, 177]. Used as a vegetable in pies etc, it can be stored for up to 6 months. Generally the fruit is fibrous, watery and less richly flavoured than *C. maxima*, *C. moschata*. and *C. pepo*[183]. The flesh can be dried, ground into a powder and mixed with cereals for making bread, cakes etc[183]. The fruit is up to 20cm in diameter[200]. Seed - raw, roasted or dried, ground into a powder

and mixed with cereals when making bread etc[183]. The seed is rich in oil and has a pleasant nutty flavour. Although relatively large[183], they are very fiddly to use because they are covered with a fibrous coat[K]. An edible oil is obtained from the seed[183]. Leaves - cooked[135]. Flowers - cooked[135, 183].

tcanta OilThe seed is rich in oil.

dwatta VermifugeThe seeds are vermifuge[7, 88]. The complete seed, together with the husk, is used. This is ground into a fine flour, then made into an emulsion with water and eaten. It is then necessary to take a purgative afterwards in order to expel the tapeworms or other parasites from the body[7]. As a remedy for internal parasites, the seeds are less potent than the root of *Dryopteris felix-mas*, but they are safer for pregnant women, debilitated patients and children[238].

propta Seed - sow early to mid spring in a greenhouse in a rich soil. Germination should take place within 2 weeks. Sow 2 or 3 seeds per pot and thin out to the best plant. Grow them on fast and plant out after the last expected frosts, giving them cloche or frame protection for at least their first few weeks if you are trying them outdoors.

nwatta Requires a rich, well-drained moisture retentive soil and a very warm, sunny and sheltered position[1]. Plants are tolerant of high temperatures but sensitive to cool conditions, they favour moderate rainfall but the roots are sensitive to water-logging[200]. A frost-tender annual plant, the Cushaw pumpkin has long been cultivated for its edible fruit especially in warmer temperate and tropical areas. There are some named varieties[183] and these are day-length neutral[200]. Plants can succeed outdoors in Britain in most summers so long as they are started off early in a greenhouse and grown on quickly. Over time, various more or less distinct groups of cultivars have been developed and these have been classified by botanists as detailed below. Since they all have similar requirements, and it can be rather difficult to classify some varieties, we have dealt with them all here and not given them separate entries. *C. argyrosperma*. The Cushaw pumpkin, as dealt with in this entry. It is subdivided into: *C. argyrosperma argyrosperma*. The silver-seed gourd. Cultivated mainly for its edible seeds which are larger than in other forms with an attractive silvery edge. *C. argyrosperma callicarpa*. Japanese pie pumpkin or green-stripe cushaw. *C. argyrosperma stenosperma*. Cultivated in Mexico, we do not know of a common name. This species does not hybridize naturally with other members of this genus, though crosses have been made under controlled conditions[86, 135]. Squashes and pumpkins can be differentiated from each other by their fruit stalk, it is angular and polygonal in pumpkins but thick, soft and round in squashes[132]. This species is included in *C. moschata* by some botanists[86].

### 3.2.17 Populus hybrids

Hybrid poplar

2 tlin 10 cyuc 3 kcaak 4 tcan 3 dwat 50 m hkuc hmimhtut cyuti kyuctup hwicli hrasjlutnyik hpa7tli frusflat-prikwissiphom hpa7tmwatli hjonli

drutta *Populus* hybrids is a TREE growing to 50 m (164ft) by 30 m (98ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid, very alkaline and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaкта Edible Parts: Inner bark Leaves SeedEdible Uses: TeaLeaves are rich in protein and have a greater amino-acid content than wheat, corn, rice and barley[226]. Carbon Farming Solutions - Staple Crop: protein (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

tcanta Biomass Fodder Plant support Resin Shelterbelt-Like willows (*Salix* spp.), their close relatives, poplars are known for fast growth and rapid biomass accumulation. Most coppice well and are easy to propagate from cuttings [1-1]. Carbon Farming Solutions - Industrial Crop: biomass (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy.

Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Agroforestry Services: wind-break, living trellis (Agroforestry is a land use management system in which trees or shrubs are grown around or among crops or pastureland). Fodder: bank. Other Systems: SRC, irreg. intercrop, strip intercrop. Commonly grown as wind-breaks. Intercropped with annuals across northern China. In Italy they are pruned to be living trellises for grape growth.

dwatta Antiinflammatory Antirheumatic Antiscurbic Antiseptic Antitussive Cathartic Diuretic Expectorant Febrifuge Ophthalmic Skin Stimulant TonicSome. See individual species. For example Balsam poplar has a long history of medicinal use. It was valued by several native North American Indian tribes who used it to treat a variety of complaints, but especially to treat skin problems and lung ailments[257]. In modern herbalism it is valued as an expectorant and antiseptic tonic. The leaf buds are antiscorbutic, antiseptic, diuretic, expectorant, stimulant, tonic[4, 46, 61, 165, 172]. The leaf buds are covered with a resinous sap that has a strong turpentine odour and a bitter taste[213]. They are boiled in alcohol to separate the resin and the resin is then dissolved in alcohol[222]. The resin is a folk remedy, used as a salve and wash for sores, rheumatism, wounds etc[222, 257]. It is made into a tea and used as a wash for sprains, inflammation, muscle pains etc[222]. Internally, the tea is used in the treatment of lung ailments and coughs[222]. The buds can also be put in hot water and used as an inhalant to relieve congested nasal passages[213]. The bark is cathartic and tonic[4]. Although no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238]. A tea made from the inner bark is used as an eye wash and in the treatment of scurvy[222].

propta Seed. Cuttings

nwatta Agroforestry Services: Living trellis Agroforestry Services: Windbreak Fodder: Bank Global Crop Industrial Crop: Biomass Management: Coppice Management: Standard Other Systems: Irreg. Intercrop Other Systems: SRC Other Systems: Strip intercrop Staple Crop: ProteinClimate: boreal to warm temperate. Humidity: semi-arid to humid. Native to much of the northern temperate region and thrive from boreal through warm temperate climates as well as tropical highlands. Some are adapted to semi-arid sites although most prefer humid conditions [1-1]. Carbon Farming Solutions - Cultivation: global crop. Management: standard, coppice (Describes the non-destructive management systems that are used in cultivation) [1-1].

### 3.2.18 Salix hybrids

Hybrid willows

2 tlin 11 cyuc 3 kcaak 5 tcan 3 dwat 25 m hkuc htut cyuti tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta *Salix* hybrids is a deciduous Shrub growing to 25 m (82ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. The flowers are pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcaкта Edible Parts: Inner bark LeavesEdible Uses: See individual species. In some species the inner bark and leaves are edible.

tcanta Basketry Biomass Fencing Filter Fodder Soil stabilization Weaving WoodWastewater treatment - converting wastewater to biomass fuel by taking up excess nutrients in warer for fertilizer. A strong, light flexible wood used for basketry, fencing and natural building. Erosion control and bank stabilization along streams and rivers [1-1]. Carbon Farming Solutions - Industrial Crop: biomass (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Fodder: bank. The leaves are a

### 3.2.41 Tamarix ramosissima

Tamarisk, Saltcedar

2 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 4.5 m hkuc htut cyuti kyuctup hwicli hrasjlutnyikfrip hpa7tli flatprikkwissiphom hpa7tmwatli xre7t hjonli

drutta *Tamarix ramosissima* is a deciduous Shrub growing to 4.5 m (14ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaкта Edible Parts: MannaEdible Uses: A manna is produced by the plants in response to insect damage to the stems[177]. It is sweet and mucilaginous and is used in confectionery[183].

tcanta Hedge Hedge Soil stabilizationVery tolerant of maritime exposure, it makes a good shelter hedge in coastal gardens[75]. It does not like being trimmed[75]. Plants have an extensive root system and can be used to control the erosion of sand dunes and other sandy soils[200].

dwatta None known

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy[200]. Cuttings of mature wood of the current seasons growth, 15 - 25cm long, planted outdoors in late autumn in a nursery bed or straight into their permanent position. High percentage[11, 200].

nwatta Landscape Uses:Seashore. An easily grown plant, succeeding in most soils and tolerant of saline conditions[11]. This species is not found in saline soils in the wild and so might not be tolerant of them in cultivation[K]. Grows well in heavy clay soils as well as in sands and even shingle[182]. Usually found near the coast, it succeeds inland if given a fairly good deep loam and a sunny position[11, 200]. Tolerant of maritime winds and dry soils when grown near the coast[11], plants require a moister soil and shelter from cold drying winds when they are grown inland in non-saline soils because they use the soil salts that are found in saline soils to help them reduce transpiration[200]. This species flowers on the current year's growth[227]. Any pruning is best carried out in spring, hedges are also best trimmed at this time[188]. Plants are tolerant of severe pruning, sprouting freely from old wood[K]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Invasive, Naturalizing, Attractive flowers or blooms.

### 3.2.42 Potentilla fruticosa

Shrubby Cinquefoil, Potentilla

2 tlin 6 cyuc 1 kcaak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyuti hgattucp hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta *Potentilla fruticosa* is a deciduous Shrub growing to 1.2 m (4ft) by 1.2 m (4ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees, flies. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcaкта Edible Parts: Edible Uses: TeaA tea is made from the dried leaves[2, 46, 61, 183, 257, 272]. Used as a substitute for China tea, especially by people living at high elevations in the Himalayas[272].

tcanta Hedge Hedge Incense Packing Soil stabilization TinderCan be grown as a medium size informal hedge[29, 200]. Trim in spring[200]. Some forms, notably 'L'ongacre', 'Elizabeth' and 'Gold Drop' have a dense spreading habit and make good ground cover plants[197]. A useful plant for controlling soil erosion[158]. The dry, flaky bark is used as a tinder for friction fires[99, 257]. (fires started by rubbing 2 pieces of wood together very fast). The powdered plant is used as an incense[272]. The leaves are used as a packing material in pillows[257].

dwatta AstringentThe leaves are astringent[240]. The juice of the root is used in the treatment of indigestion[272].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 3 - 5cm with a heel, July/August in a frame. Pot up in the autumn if possible and overwinter in a cold frame[78]. Softwood cuttings taken in the early summer[11, 113]. Easy.

nwatta Landscape Uses:Border, Foundation, Ground cover, Massing, Rock garden, Specimen. Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Prefers a light well-drained soil[108]. Established plants are drought tolerant[190]. A very cold-hardy plant, tolerating temperatures down to at least -25°C[184]. A very ornamental shrub[1], there are many named varieties[11]. Polymorphic[11]. A good bee plant[108]. Members of this genus are rarely if ever troubled by browsing deer[233]. Dislikes growing under trees, especially Juglans species[18]. Plants are usually dioecious but hermaphrodite forms are also known[182]. Male and female plants must be grown if seed is required. Special Features: North American native, Attracts butterflies, Attractive flowers or blooms.

### 3.2.43 Coreopsis tinctoria

Coreopsis, Golden tickseed, Atkinson's tickseed, Dyer's Coreopsis, Plains Coreopsis, Annual Coreops  
2 tlin 11 cyuc 1 kcaak 1 tcan 1 dwat 0.8 m hkuc htut cyuti hgatkyuctup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Coreopsis tinctoria* is a ANNUAL growing to 0.8 m (2ft 7in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from April to November, in flower from June to September, and the seeds ripen from June to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaкта Edible Parts: Edible Uses: CoffeeA tea can be made from the dried plant[257]. It was used as a coffee substitute[257].

tcanta DyeA yellow (red with an acid mordant) dye is obtained from the flowers and is used to dye cloth[169, 244, 257]. It is not very good when used on plant fibres[169]. The flowers can be dried for later use[169]. Cultivated as an ornamental plant for gardens, and as a native plant for wildlife gardens and natural landscaping.

dwatta Astringent EmeticaA tea made from the roots is emetic and is also used in the treatment of diarrhoea[222, 257]. An infusion of the whole plant without the root has been used by women desiring a female baby[257].

propta Seed - sow March in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer[111]. If you have sufficient seed then it can also be sown in situ outdoors.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Specimen. Succeeds in ordinary garden soil[1]. Prefers a fertile well-drained moisture retentive medium soil[111, 200]. Does well in sandy soils[188]. Requires a sunny position[111, 200]. Established plants are drought resistant[1]. A good bee plant[200]. Special Features: Attracts birds, North American native, Naturalizing, Wetlands plant, Attracts butterflies, Suitable for cut flowers.

insecticidal effect on the soil, effective against nematodes and to some extent against keeled slugs[18, 20, 200, 218]. These secretions are produced about 3 - 4 months after sowing[200]. The whole plant is harvested when in flower and distilled for its essential oil[218, 238]. The oil is used in perfume, it is blended with sandalwood oil to produce 'attar genda' perfume[238]. About 35 kilos of oil can be extracted from 1 hectare of the plant (yielding 2,500 kilos of flowers and 25,000 kilos of herbage)[218]. The whole plant contains substances that are toxic to cockroaches[218]. The growing plant repels whitefly and can be grown near tomatoes to keep that crop free of the insect[18, 20]. A yellow dye is obtained from the flowers[169]. It is used to colour foods and textiles[238]. The flowers are sometimes used as an adulterant of saffron (obtained from *Crocus sativus*)[238]. Dynamic accumulator.

**dwatta Aromatic Digestive Diuretic Dysentery Sedative**The whole herb is aromatic, digestive, diuretic and sedative[238]. It is used internally in the treatment of indigestion, colic, severe constipation[238], coughs and dysentery[218]. Externally, it is used to treat sore eyes and rheumatism[238]. The leaves are harvested as required for immediate use during the growing season, whilst the flowering plant can be dried and stored for later use[238].

**propta Seed - sow March** in a greenhouse. Only just cover the seed. Germination usually takes place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts.

**nwatta** Requires a well-drained moderately fertile soil in a sunny position[200]. Grows well in heavy clay soils and in sandy soils[188]. A very ornamental plant[1], there are many named varieties[188]. A good butterfly plant[30]. Removing dead flowers before the seed is formed will extend the flowering season[188]. The bruised leaves emit a refreshing pungent smell[245]. Plants are prone to slugs, snails and botrytis[188]. The French marigold is often used as a companion plant, especially for growing amongst tomatoes and potatoes where it helps to repel pests[238]. See 'Other uses' below for more details.

### 3.2.39 *Coptis trifolia*

Goldthread, Threeleaf goldthread  
2 tin 7 cyuc 2 kcaak 2 tcan 2 dwat 0.2 m hkcuc  
hmim cyuti tcup hwicli hrasjlutnyik hpa7tli flat hpa7tmwatli xre7t hjonli

**drutta** *Coptis trifolia* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

**kcaakta Edible Parts:** Leaves**Edible Uses:** CondimentThe whole plant is said to be eaten[105, 177], or it can be mixed with sassafras-root bark and Irish moss and brewed into a kind of herbal root beer[183]. This plant contributes a bitter flavour and a yellow colour to the beverage[183]. Some caution is advised, see the notes above on toxicity.

**tcanta Dye**A yellow dye is obtained from the leaves and stems[207]. Can be grown as a ground cover plant in the peat garden[200].

**dwatta** Antibacterial Antiinflammatory Antiphlogistic Astringent Sedative Skin Stomachic TonicGoldthread is a very bitter tasting herb that was formerly highly valued and widely used in North America by the native Indians and white settlers alike, though it is little used in modern herbalism[254]. It was employed mainly to treat any soreness in the mouth[254]. The dried roots, stems and leaves are antiphlogistic, highly astringent, sedative, stomachic, tonic[4, 21, 46, 61, 207, 222]. The plant is valued as a local application in the treatment of thrush in children[4]. It is also used in the treatment of ulcerated mouths and as a gargle for sore throats or mouths[21, 46, 61, 207, 213]. It is said to be useful in the treatment of dyspepsia and helpful in combating the drink habit[4]. The plant contains the alkaloid 'berberine', which is a mild sedative[213], anti-inflammatory and antibacterial[222]. The root is collected in the autumn and dried for later use[213].

**propta Seed - best sown** in a greenhouse as soon as it is ripe in an ericaceous compost[164]. Seal the pot in a polythene bag until germination takes place, which is usually within 1 - 6 months at 10°C[164]. Stored seed should be sown as early in the year as possible. Four weeks cold stratification may be beneficial[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least their first winter. Plant them out in mid-autumn or in spring. Division in spring[200].

**nwatta** Requires a light moist humus-rich slightly acidic soil with a northerly aspect or light shade[1, 200]. A very ornamental plant[1]. The sub-species *C. trifolia* greenlandica (Syn *C. greenlandica*) is the form used medicinally in N. America[222]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.40 *Tagetes tenuifolia*

Lemon Marigold, Striped Mexican Marigold, Signet Marigold  
2 tin 11 cyuc 2 kcaak 3 tcan 0 dwat 0.8 m hkcuc  
htut cyuti kyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Tagetes tenuifolia* is an ANNUAL growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcaakta Edible Parts:** Edible Uses: CondimentThe flowers of some cultivars have a pleasant citrus-like flavour and can be used sparingly as a flavouring in salads, sandwiches, wines etc or used as a garnish[183].

**tcanta** CompanionLandscape Uses: Border, Container, Specimen. There are some named forms, selected for their ornamental value[183]. **Special Features:** Attractive foliage, North American native, Fragrant foliage, Suitable for cut flowers, Suitable for dried flowers. Secretions from the roots of growing plants have an insecticidal effect on the soil, effective against nematodes and to some extent against keeled slugs, they also have an effect against some persistent weeds such as couch grass[118, 20, 200]. The plant also has an effect on asparagus beetle and bean weevils. These secretions are produced about 3 - 4 months after sowing. A yellow dye is obtained from the flowers[169]. Dynamic accumulator.

**dwatta** None known  
**propta Seed - sow March** in a greenhouse. Only just cover the seed. Germination usually takes place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts.

**nwatta** Requires a well-drained moderately fertile soil in a sunny position[200]. Grows well in heavy clay soils and in sandy soils[188]. There are some named forms, selected for their ornamental value[183]. The bruised foliage is perhaps more refreshingly aromatic than any other plant[245]. The lemon verbena-like smell remaining on the fingers for an hour or more after touching the plant[245]. Removing dead flowers before the seed is formed will extend the flowering season[188]. Plants are prone to slugs, snails and botrytis[188]. Grows well with tomatoes[20].

good fodder for livestock. Other Systems: SRC. Dynamic accumulator.

**dwatta** Some. See individual species. Willow bark was the basis for aspirin development. Many cultures have used willow bark for pain relief, thanks to a compound in willow bark called salicin.

**propta Seed**  
**nwatta Fodder:** Bank Industrial Crop: Biomass Management  
**Coppice** Minor Global Crop Other Systems: SRCClimate: , tropical highlands. Humidity: semi-arid to humid, aquatic. There are tree, shrub, and ground cover willows. Usually coppiced or pollarded when managing. Some coppiced willows have lived to 800 years. Easy to breed and hybridize. Willows are very cross-compatible, and numerous hybrids occur, both naturally and in cultivation. A well-known ornamental example is the weeping willow (*Salix x sepulcralis*), which is a hybrid of Peking willow (*Salix babylonica*) from China and white willow (*Salix alba*) from Europe. Breeding work has increased biomass yields 50% in the last few decades. European breeding emphasises *Salix viminalis* and four or five others while North America is based on *Salix purpurea* and others. Carbon Farming Solutions - Cultivation: minor global crop. Management: coppice (Describes the non-destructive management systems that are used in cultivation) [1-1].

### 3.2.19 *Betula pendula*

Silver Birch, European white birch, Common Birch, Warty Birch, European White Birch  
2 tin 6 cyuc 3 kcaak 5 tcan 3 dwat 20 m hkcuc  
htut cyuti kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli frusflatprikliw hpa7tmwatli hjonli

**drutta** *Betula pendula* is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in April, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcaakta Edible Parts:** Flowers Inner bark Leaves Sap**Edible Uses:** TeaInner bark - cooked or dried and ground into a meal[2, 15, 105]. It can be added as a thickener to soups etc or can be mixed with flour for making bread, biscuits etc. Inner bark is generally only seen as a famine food, used when other forms of starch are not available or are in short supply[115, 177, KJ. Sap - raw or cooked. A sweet flavour. It is harvested in early spring, before the leaves unfurl, by tapping the trunk. It makes a pleasant drink[115]. It is often concentrated into a syrup by boiling off the water[2, 9, 13, 15, 177]. Between 4 and 7 litres can be drawn off a mature tree in a day and this will not kill the tree so long as the tap hole is filled up afterwards[115]. However, prolonged or heavy tapping will kill the tree[115]. The flow is best on sunny days following a frost. The sap can be fermented into a beer. An old English recipe for the beer is as follows: "To every Gallon of Birch-water put a quart of Honey, well stir'd together; then boil it almost an hour with a few Cloves, and a little Limon-peel, keeping it well scumm'd. When it is sufficiently boil'd, and become cold, add it to three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it up. . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk antepastum."[269]. Young leaves - raw or cooked[15]. Young catkins[15]. No more details are given. A tea is made from the leaves[15, 161] and another tea is made from the essential oil in the inner bark[21].

**tcanta** Adhesive Besom Charcoal Compost Dye Essential Fibre Fungicide Hair Miscellany Paper Pioneer Polish Repellent Tannin Thatching Waterproofing WoodThe bark is used to make drinking vessels, canoe skins, roofing tiles etc[115]. It is waterproof, durable, tough and resinous. Only the outer bark is removed, this does not kill the tree. It is most easily removed in late spring to early summer. A pioneer species, it

readily invades old fields, cleared or burnt-over land and creates conditions suitable for other woodland trees to become established. Since it is relatively short-lived and intolerant of shade, it is eventually out-competed by these trees[17, 186]. A tar-oil is obtained from the white bark in spring. It has fungicidal properties and is also used as an insect repellent[4, 13, 100]. It makes a good shoe polish[61]. Another report says that an essential oil is obtained from the bark and this, called 'Russian Leather' has been used as a perfume[245]. A decoction of the inner bark is used to preserve cordage[115], it contains up to 16% tannin[178, 223]. An oil similar to Wintergreen oil (obtained from *Gaultheria procumbens*) is obtained from the inner bark[21, 61]. It is used medicinally and also makes a refreshing tea[21]. The resin glands (the report does not say where these glands are found) are used to make a hair lotion[226]. A brown dye is obtained from the inner bark A glue is made from the sap[2, 9, 13, 15]. Cordage can be made from the fibres of the inner bark[115]. This inner bark can also be separated into thin layers and used as a substitute for oiled paper[4]. The young branches are very flexible and are used to make whisks, besoms etc[6]. They are also used in thatching[13, 100] and to make wattles[4]. The leaves are a good addition to the compost heap, improving fermentation[14]. Wood - soft, light, durable. It is used for a wide range of purposes including furniture, tool handles, toys and carving[13, 100, 238]. A high quality charcoal is obtained from the bark. It is used by artists, painters etc[13]. The wood is also pulped and used for making paper[238].

**dwatta** Anticholesterolemic Antiinflammatory Antirheumatic Antiseborrheic Antiseptic Astringent Bitter Cholagogue Diaphoretic Diuretic Eczema Laxative Lithontripic Miscellany Skin UrinaryAnti-inflammatory, cholagogue, diaphoretic[21, 165, 201]. The bark is diuretic and laxative[7]. An oil obtained from the inner bark is astringent and is used in the treatment of various skin afflictions, especially eczema and psoriasis[4, 238]. The bark is usually obtained from trees that have been felled for timber and can be distilled at any time of the year[238]. The inner bark is bitter and astringent, it is used in treating intermittent fevers[4]. The vernal sap is diuretic[4]. The buds are balsamic[7]. The young shoots and leaves secrete a resinous substance which has acid properties, when combined with alkalis it is a tonic laxative[4]. The leaves are anticholesterolemic and diuretic[7]. They also contain phytoestrogens, which are effective germicides[7]. An infusion of the leaves is used in the treatment of gout, dropsy and rheumatism, and is recommended as a reliable solvent of kidney stones[4]. The young leaves and leaf buds are harvested in the spring and dried for later use[238]. A decoction of the leaves and bark is used for bathing skin eruptions[4]. Moxa is made from the yellow fungous excrescences of the wood, which sometimes swell out of the fissures[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

**propta Seed - best sown** as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

**nwatta** Landscape Uses:Firewood, Specimen. A very easily grown plant, it tolerates most soils including poor ones[1, 24], sandy soils[188] and heavy clays. It prefers a well-drained loamy soil in a sunny position[11, 200]. It is occasionally found on calcareous soils in the wild but it generally prefers a pH below 6.5, doing well on acid soils[186]. Fairly wind tolerant[200] though it becomes wind shaped when exposed to strong winds[K]. The silver birch is a very ornamental tree[1] with many named varieties[11, 200]. It also has a very wide range of economic uses. It is a fast

growing tree, increasing by up to 1 metre a year, but is short-lived[17, 200]. It is often one of the first trees to colonize open land and it creates a suitable environment for other woodland trees to follow[17]. These trees eventually out-compete and shade out the birch trees[17, 186]. It makes an excellent nurse tree for seedling trees, though its fine branches can cause damage to nearby trees when blown into them by the wind. Trees take about 15 years from seed to produce their own seed[98]. Although closely related, it does not usually hybridize with *B. pubescens*[11]. It often hybridizes with *B. pubescens* according to another report[186]. A superb tree for encouraging wildlife, it has 229 associated insect species[24]. A good plant to grow near the compost heap, aiding the fermentation process[14, 20]. It is also a good companion plant, its root action working to improve the soil[14]. Trees are notably susceptible to honey fungus[200]. Special Features: Not North American native, Attractive flowers or blooms.

### 3.2.20 *Betula pubescens*

White Birch, Downy birch  
 2 tin 9 cyuc 3 kcaak 5 tcan 3 dwat 20 m hkuc  
 htut cyutli kyuctcuphja7n hwicli hyshrasljutnykfrrip hpa7tli frusflatprikhwis hpa7tmwatli hjonli

drutta *Betula pubescens* is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 1. It is in flower in April, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Inner bark Leaves SapEdible Uses: Tealinner bark - cooked or dried, ground into a powder then used with cereals for making bread etc[2, 15, 46]. Inner bark is generally only seen as a famine food, used when other forms of starch are not available or are in short supply[177, K]. Sap - raw or cooked. A sweet flavour[2, 15, 177]. Harvested in early spring, before the leaves unfurl, by tapping the trunk. The flow is best on sunny days following a heavy frost. The sap is often concentrated into a sugar by boiling off the water. Between 4 and 7 litres can be drawn off a mature tree in a day and this will not kill the tree so long as the tap hole is filled up afterwards[115]. However, prolonged or heavy tapping will kill the tree. A beer can be fermented from the sap. An old English recipe for the beer is as follows:- "To every Gallon of Birch-water put a quart of Honey, well stirr'd together; then boil it almost an hour with a few Cloves, and a little Limon-peel, keeping it well scummd'. When it is sufficiently boil'd, and become cold, add to it three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it up. . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk ante pastum."[269]. Young leaves - raw or cooked[15, 177]. Young catkins[15]. No more details are given. A tea is made from the leaves[15] and another tea is made from the essential oil in the inner bark[21].

tcanta Adhesive Besom Charcoal Compost Dye Essential Fibre Fungicide Miscellany Paper Pioneer Polish Repellent Tannin Thatching Waterproofing WoodThe bark is used to make drinking vessels, canoe skins, roofing tiles etc. It is waterproof, durable, tough and resinous[11, 61]. Only the outer bark is removed, this does not kill the tree. It is most easily removed in late spring to early summer. The bark was pressed flat and stored until the following spring. When required for making canoes it would be heated over a fire to make it pliable for shaping to the canoe frame[257]. A pioneer species, it readily invades old fields, cleared or burnt-over land and creates conditions suitable for other woodland trees to become established. Since it is relatively short-lived and intolerant of shade, it is eventually out-competed by these trees[11, 186]. A tar-oil is obtained from the white bark in spring. It has fungicidal properties and is also used as an insect repellent[4, 14, 61, 100]. It makes a good shoe

polish[61]. Another report says that an essential oil is obtained from the bark and this, called 'Russian Leather' has been used as a perfume[245]. A glue is made from the sap. Cordage can be made from the fibres of the inner bark. This inner bark can also be separated into thin layers and used as a substitute for oiled paper[4]. A decoction of the inner bark is used to preserve cordage, it is rich in tannin. The bark contains up to 16% tannin[223]. A brown dye is obtained from the inner bark. An oil similar to Wintergreen oil (obtained from *Gaultheria procumbens*) is obtained from the inner bark[21, 61]. It is used medicinally and also makes a refreshing tea[21]. The young branches are very flexible and are used to make whisks, besoms etc[6]. They are also used in thatching and to make wattles[4]. The leaves are a good addition to the compost heap, improving fermentation[20]. A black paint is obtained from the soot of the plant[61]. A high quality charcoal is obtained from the bark. It is used by artists, painters etc. Wood - soft, light, durable. It is used for a wide range of purposes including furniture, tool handles, carving, toys etc[100, 238]. It is a source of charcoal that is used by artists and is also pulped and used for making paper[238].

dwatta Antirheumatic Antiseborrheic Astringent Bitter Diaphoretic Diuretic Eczema Lithotropic Miscellany Skin UrinaryAnti-inflammatory, cholagogue, diaphoretic[21, 165, 201]. The bark is diuretic and laxative[7]. The inner bark is bitter and astringent, it is used in treating intermittent fevers[4]. An oil obtained from the inner bark is astringent and is used in the treatment of various skin afflictions, especially eczema and psoriasis[4, 238]. The bark is usually obtained from trees that have been felled for timber and can be distilled at any time of the year[238]. The buds are balsamic[7]. The young shoots and leaves secrete a resinous substance which has acid properties, when combined with alkalis it is a tonic laxative[4]. The leaves are anticholesterolemic and diuretic[7]. They also contain phytoalexins, which are effective germicides[7]. An infusion of the leaves is used in the treatment of gout, dropsy and rheumatism, and is recommended as a reliable solvent of kidney stones[4]. The young leaves and leaf buds are harvested in the spring and dried for later use[238]. A decoction of the leaves and bark is used for bathing skin eruptions[4]. The vernal sap is diuretic[4]. The boiled and powdered wood has been applied to chafed skin[257]. Moxa is made from the yellow fungous excrescences of the wood, which sometimes swell out of the fissures[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Succeeds in a well-drained light loamy soil in a sunny position[11, 200]. Grows well in heavy clay soils. Tolerates a wet position[11, 24], succeeding in poorly drained soils[186]. Fairly wind tolerant[200]. Prefers an acid soil. A very ornamental tree and fast growing, capable of growing 1 metre a year but it is short-lived[186]. It is one of the first trees to colonize open land and it creates a suitable environment for other woodland trees to follow[11]. These trees eventually shade out the birch trees[186]. Trees take about 15 years from seed to produce their own seed[98]. Although closely related, it does not usually hybridize with *B. pendula*[11]. It hybridizes freely with *B. pendula* according to another report[186]. A superb tree for encouraging wildlife, it has over 200 associated insect species[24, 30]. A good plant to grow near the compost heap, aiding the fermentation process[14, 20]. It is also a good companion plant, its root activity working to improve the soil[14]. Trees are no-

is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 3.2.36 *Matteuccia struthiopteris*

Ostrich Fern  
 2 tin 7 cyuc 2 kcaak 2 tcan 1 dwat 1 m hkuc  
 hmim cyutli tcup hwicli hrasljutnykfrrip hpa7tli frusflatprik hpa7tmwatli hjonli

drutta *Matteuccia struthiopteris* is a FERN growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young fronds - raw or cooked[62, 102, 116, 172]. Used before they fully unroll, they are thick and succulent[183]. Sometimes sold in speciality markets, the flavour can be compared to asparagus[200]. Another report says that they are a famine food that is only used in times of need in China[177]. Root-stock - peeled and roasted[106, 172, 183].

tcanta MiscellanyPlants make a good ground cover[200] when spaced about 60cm apart each way[208]. They spread slowly and the fronds tend to die off earlier in the autumn than most ferns[208].

dwatta Birthing aid MiscellanyA decoction of the leaf stalk base from sterile fronds has been taken in the treatment of back pain and also to help speed up the expulsion of the afterbirth[257].

propta Spores - surface sow as soon as they are ripe in mid-winter and keep the soil moist. It is best to keep the pot in a sealed plastic bag to hold in the moisture. Pot up small clumps of the young plants as soon as they are large enough to handle and grow on in light shade until large enough to plant out. Division during the dormant season between October and March[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Specimen, Woodland garden. Requires a moist but well-drained position and light shade[1, 187]. Grows well in heavy clay soils. Dislikes full sun, the leaves turning yellow and burning in such a situation[200]. Prefers a pH between 5 and 6.5[200]. Dormant plants are hardy to at least -20°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1], it establishes rapidly[187]. It has a short rhizome but produces long stolons, by which it spreads rapidly once established[187], and it can be invasive[200]. Fertile fronds are produced after the first flush of vegetative fronds and persist throughout the following winter. The spores are shed in mid-winter[200]. Grown commercially for its decorative fronds[106]. These fronds are also available as a food from speciality markets[183, 200]. Plants can be forced in the winter to provide an early supply of the young shoots[183]. Special Features:Attractive foliage, North American native, Invasive, There are no flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.37 *Andromeda polifolia*

Marsh Andromeda, Bog rosemary  
 2 tin 6 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc  
 hmim cyutli tucphja7n hwicli hrasljut hpa7tli frusflat hpa7tmwatli fyixre7t hjonli

drutta *Andromeda polifolia* is an evergreen Shrub growing to 0.3 m (1ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: TeaThe tender leaves and shoot-tips are boiled as an aromatic tea[161, 177]. A delicious drink[183]. Some caution is advised since boiling the plant or infusing it in hot water is said to release a toxic chemical[183]. It is safer to soak the leaves in a jar of water in direct sunlight to make 'sun tea'[183].

tcanta TanninTannin is obtained from the leaves and twigs[61].

dwatta PectoralThe plant is used as a respiratory aid in the treatment of catarrh[257].

propta Seed - sow February/March in an acid compost in the greenhouse. Surface sow or only just cover the seed and place in a lightly shaded position[78, 133]. The seed usually germinates in 1 - 2 months at 12°C[133]. Prick out the young seedlings into individual pots as soon as possible, they are prone to damp-off and so should be kept well ventilated[78]. Grow them on in the greenhouse for at least their first winter and plant them out in early summer once they are 15cm or more tall. Cuttings of half-ripe wood, 5 - 7cm with a heel, July/August in a frame in a shady position. Takes 15 months[78]. Layering in August in a semi-shady position. Takes 18 months[78]. Division in early spring. The plants should be 'dropped' beforehand[78]. This entails digging up the plant 6 to 12 months earlier and replanting it somewhat more deeply. The buried branches will then root and form new plants when divided.

nwatta Landscape Uses:Border, Container, Rock garden, Specimen. Requires a well-drained, moisture-retentive, lime-free, humus-rich soil and a shady position[133, 182, 200]. Plants spread slowly by means of suckers when they are grown in a suitable position[182]. A very ornamental plant, there are many named varieties[182]. Special Features:North American native, Attractive flowers or blooms.

### 3.2.38 *Tagetes patula*

French Marigold, Dwarf French Marigold  
 2 tin 11 cyuc 2 kcaak 4 tcan 2 dwat 0.5 m hkuc  
 htut cyutli kyuctcup hwicli hrasljutnykfrrip hpa7tli flatprikhlwis hpa7tmwatli xre7t hjonli

drutta *Tagetes patula* is a ANNUAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower from July to October, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Colouring Condiment DrinkThe flowers are used in refreshing drinks[177, 183]. The leaves are used as a food flavouring[183, 238]. No further details are given. The essential oil is used as a food flavouring, though it is inferior to the oil obtained from *T. minuta*[238]. The dried flowers are an adulterant of saffron (*Crocus sativus*), used for colouring foods yellow[183, 238].

tcanta Companion Dye Essential Insecticide Repellent-Landscape Uses: Border, Container, Foundation, Massing, Seashore, Specimen. A very ornamental plant[1]. Special Features: North American native, Fragrant foliage, Naturalizing, Suitable for cut flowers, Suitable for dried flowers. Secretions from the roots of growing plants have an



gus[200]. Special Features:North American native, Inconspicuous flowers or blooms.

### 3.2.34 Viburnum dentatum

Arrow Wood, Southern arrowwood, Southern Arrowwood Viburnum

2 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 4.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum dentatum is a deciduous Shrub growing to 4.5 m (14ft 9in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A pleasantly sweet flavour, but there is very little edible flesh surrounding a relatively large seed[K]. The fruit is up to 9.5mm in diameter[200].

tcanta None known dwatta Birthing aid ContraceptiveA decoction of the twigs has been taken by women to prevent conception[257]. A poultice of the plant has been applied to the swollen legs of a woman after she has given birth[257]. Both of the above uses are for the sub-species *V. dentatum lucidum*. Ait.[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Seashore, Specimen, Woodland garden. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Special Features:Attracts birds, North American native, Attracts butterflies, Blooms are very showy.

### 3.2.35 Cornus sericea

Red Osier Dogwood, Western dogwood

2 tlin 7 cyuc 2 kcaak 4 tcan 2 dwat 2.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cornus sericea is a deciduous Shrub growing to 2.5 m (8ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly

alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Oil OilFruit - raw or cooked[105, 161, 257]. Juicy[101]. Bitter and unpalatable according to some reports[2], it was mixed with other fruits such as junberries (*Amelanchier* spp) and then dried for winter use by native North Americans[257]. The fruit can cause nausea[172]. The fruit is up to 9mm in diameter[200]. Seed[101]. No more details are given, but the seeds are quite small and woody, looking rather less than edible[K]. An edible oil is obtained from the seed[4].

tcanta Basketry Dye Fibre Fodder Miscellany Oil Oil TeethA fibre obtained from the bark is used as cordage[99]. The bark can be twisted into a rope[257]. The powdered bark has been used as a toothpowder to preserve the gums and keep the teeth white[4]. An oil obtained from the seed burns well and can be used in lighting[4]. A red dye can be obtained from the bark mixed with cedar ashes[257]. The branches are pliable, they are used as rims in basket making[99, 257]. The stem wood is very tough and flexible[212]. Plants can be grown as a tall ground cover for colonising large areas. The cultivar 'Flaviramea' has been recommended[208]. Red osier is noted as a good Carbon Farming Solution plant. It can be coppiced, used as fodder and act as a living fence. It is a industrial biomass crop.

dwatta Analgesic Astringent Febrifuge Miscellany Poul-tice Purgative Skin Stimulant TonicRed osier dogwood was widely employed by several native North American Indian tribes who valued it especially for its astringent and tonic bark, using it both internally and externally to treat diarrhoea, fevers, skin problems etc[257]. It is little used in modern herbalism. The bark and the root bark are analgesic, astringent, febrifuge, purgative, slightly stimulant and tonic[4, 172, 257]. Drying the bark removes its tendency to purge[172]. A decoction has been used in the treatment of headaches, diarrhoea, coughs, colds and fevers[257]. Externally, the decoction has been used as a wash for sore eyes, styes and other infections and also to treat skin complaints such as poison ivy rash and ulcers[257]. The bark shavings have been applied as a dressing on wounds to stop the bleeding[257]. A poultice of the soaked inner bark, combined with ashes, has been used to alleviate pain[257]. The plant is said to have cured hydrophobia[4].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Agroforestry Services: Living fence Fodder: Bank Industrial Crop: Biomass Management: Cop-pice Regional CropAn easily grown plant, it succeeds in any soil of good or moderate fertility[11], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Prefers a moist soil and a position in sun or partial shade[108]. Succeeds in poorly drained soils[200]. Plants are hardy to about -35°C[184]. A rampant suckering shrub[1]. A number of cultivars have been developed for their ornamental value[182]. This species is closely allied to *C. alba*[11]. The flowers are very attractive to bees[108]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant

tably susceptible to honey fungus[200].

### 3.2.21 Vitis riparia

Riverbank Grape

2 tlin 6 cyuc 3 kcaak 2 tcan 0 dwat 15 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Vitis riparia is a deciduous Climber growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from May to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit Leaves Sap ShootsEdible Uses: Fruit - raw or dried for later use[22, 46, 62, 161, 183]. Juicy and somewhat acid[183]. The taste is best after a frost[101]. The fruit is about 6 - 12mm in diameter[200] and is carried in fairly large bunches[K]. Leaves - cooked[55, 159]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked[55, 85, 159]. Sap - raw[101, 161]. A sweet flavour, it is used as a drink[183]. The sap can be harvested in the spring and early summer, though it should not be taken in quantity or it will weaken the plant[K].

tcanta Dye RootstockA yellow dye is obtained from the fresh or dried leaves[168]. The plant is used as a rootstock for the common grape, *V. vinifera*, especially in areas where phylloxera disease is prevalent[183].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182]. They grow particularly well into elm trees[18]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Occasionally cultivated for its edible fruit in N. America[46], there are some named varieties[183]. 'Brandt' is of uncertain parentage, probably involving this species, it usually ripens its fruit in S.E. England[11]. Resistant to Phylloxera disease, a disease that almost destroyed the European grape crops. This species can be used as a rootstock in areas where the disease is prevalent and can also be used in breeding programmes with *V. vinifera* in order to impart resistance to that species[183]. The flowers are powerfully scented of mignonette[245]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

### 3.2.22 Viburnum cassinoides

Withe Rod, Appalachian Tea, Witherod Viburnum, Witherod, Wild Raisin Viburnum

2 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli dyatxre7t hjonli

drutta Viburnum cassinoides is a deciduous Shrub growing to 2.5 m (8ft 2in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[3, 46, 62, 65, 101]. The scant flesh is sweet and well flavoured, hanging on the plant well into the winter[183]. The oval fruit is about 10mm long and contains a single large seed[235, K]. The leaves are used as a tea substitute[46, 61]. A pleasant taste[183]. The leaves are steamed over boiling water, rolled between the fingers, allowed to stand overnight and then dried in an oven to be used as required[183].

tcanta None known dwatta Antispasmodic Diaphoretic Febrifuge Mouth-wash TonicThe bark and root bark is antispasmodic, diaphoretic, febrifuge and tonic[257]. An infusion has been used to treat recurrent spasms, fevers, smallpox and ague[257]. The infusion has also been used as a wash for a sore tongue[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Hedge, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It dislikes chalk, growing best on lime-free soils[3, 182]. Prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in the spring[200]. This species is closely allied to *V. nudum*[11]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fertile seed[11, 200]. There is at least one named variety, selected for its ornamental value[200]. 'Nanum' has a dwarf habit and the leaves have a rich autumn colouring[200]. Special Features: North American native, Fragrant flowers, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 3.2.23 Ribes alpinum

Alpine Currant

2 tlin 7 cyuc 3 kcaak 4 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hysihrasjlutnyik hpa7tli flatprik-lwis hpa7tmwatli nyanhjen hjonli

drutta Ribes alpinum is a deciduous Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Flies, bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. Sweet and not very acid, but less palatable than R. rubrum, the red currant[2]. An insipid fruit[100], it is not palatable[1, 11]. The only fruits we have eaten have been good size red currants with a fair flavour[K]. The fruit is about 5mm in diameter and can be freely borne when male and female plants are grown[K].

tcanta Hedge HedgeThe cultivar ‘Green Mound’ makes a good dwarf hedge[182]. Plants can be grown as a tall ground cover when spaced about 2 metres apart each way[208]. The cultivars ‘Aureum’ and ‘Pumilion’ are smaller growing and should be spaced about 1 metre apart[208].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 0 - 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year’s growth, preferably with a heel of the previous year’s growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Landscape Uses:Erosion control, Foundation, Ground cover, Massing, Rock garden, Seashore. Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. This species succeeds on poor soils[11]. Does well in shade though it does not fruit so well in such a position[11]. A very hardy plant, tolerating temperatures down to about -25°C[184]. A number of named varieties have been developed for their ornamental value. The flowers are sweetly fragrant[208]. Plants are dioecious. At least one male plant must be grown in the vicinity of up to 5 females if fruit is required. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 3.2.24 Tagetes erecta

African Marigold, Aztec marigold, Big Marigold, American Marigold

2 tin 11 cyuc 3 ckak 3 tcan 5 dwat 1 m hkuc htut cyutli kyuctup hwicli hrsajlutnyikfrip hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta Tagetes erecta is a ANNUAL growing to 1 m (3ft 3in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

ckakta Edible Parts: FlowersEdible Uses: Colouring CondimentThe petals of the flowers of some varieties can be eaten[183]. The fresh receptacle is eaten by children[272]. A yellow dye obtained from the flowers can be used as a saffron substitute for colouring and flavouring foods[183]. The plant is used as a condiment[177]. (This probably refers to the use of the flowers as an edible dye)

tcanta Companion Dye Insecticide RepellentLandscape Uses:Border, Container, Foundation, Massing, Seashore, Specimen. Secretions from the roots of growing plants have

an insecticidal effect on the soil, effective against nematodes and to some extent against keeled slugs. These secretions are produced about 3 - 4 months after sowing[200]. The flower petals also have nematacidal properties[218]. The growing plant is also said to repel insects and can be grown amongst crops such as potatoes and tomatoes. A yellow dye is obtained from the flowers[169, 257]. Dynamic accumulator.

dwatta Anthelmintic Aromatic Carminative Digestive Diuretic Dysentery Eczema Emmenagogue Laxative Ophthalmic Sedative Skin StomachicThe whole herb is anthelmintic, aromatic, digestive, diuretic, emmenagogue, sedative and stomachic[61, 238]. It is used internally in the treatment of indigestion, colic, severe constipation[238], coughs and dysentery[218]. Externally, it is used to treat sores, ulcers, eczema, sore eyes and rheumatism[218, 238, 257, 272]. The leaves are harvested as required for immediate use during the growing season, whilst the flowering plant can be dried and stored for later use[238]. A paste of the leaves is applied externally to treat boils, carbuncles and earaches[272]. The flowers are carminative, diuretic and vermifuge[272]. A decoction is used to treat colds, and mumps[218]. It is applied externally to treat skin diseases, conjunctivitis and sore eyes[218, 272]. The root is laxative[272].

propta Seed - sow March in a greenhouse. Only just cover the seed. Germination usually takes place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts.

nwatta Requires a well-drained moderately fertile soil in a sunny position[200]. Grows well in heavy clay soils and in sandy soils[188]. Although not very frost resistant, it can be grown as a tender annual in Britain, sowing the seed in a greenhouse in the spring and planting out after the last expected frosts. The flowers are often sold in local markets in Nepal and used as an offering to the Gods[272]. A number of named forms have been developed for their ornamental value[183]. The cultivar ‘Yellow Climax’ has mild flavoured edible flowers that can be used as colourful garnishes[183]. All parts of the plant emit an unpleasant smell similar to that of stale urine when they are bruised[245]. Removing dead flowers before the seed is formed will extend the flowering season[188]. Plants are prone to attacks by slugs, snails and botrytis[188]. Special Features: North American native, Fragrant foliage, Suitable for cut flowers, Suitable for dried flowers.

### 3.2.25 Calendula officinalis

calendula, Pot Marigold

2 tin 11 cyuc 3 ckak 4 tcan 5 dwat 0.6 m hkuc hnmihut cyutli tcup hwicli hrsajlutnyik hpa7tli frusflat-prikwisslip hpa7tmwatli hjonli

drutta Calendula officinalis is a ANNUAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to November, and the seeds ripen from August to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Flowers LeavesEdible Uses: Colouring TeaLeaves - raw[14, 21]. When eaten they first of all impart a viscid sweetness, followed by a strong penetrating taste of a saline nature[4]. They are very rich in vitamins and minerals and are similar to Taraxacum officinale (Dandelion) in nutritional value[179]. Fresh petals are chopped and added to salads[183]. The dried petals have a more concentrated flavour and are used as a seasoning in soups, cakes etc[183]. High in vitamins A and C[218]. An edible yellow dye is obtained from the petals[46]. A saffron substitute[21], it is used to colour and flavour rice, soups etc[2, 14, 27, 33]. It is also used as a hair rinse, adding golden tints to brown or auburn hair[201]. A tea is made from the petals and flowers, that made from the petals is less bitter[183]. There is

wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Christmas tree, Firewood, Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. A fast growing tree, especially when young with annual increases of up to 1 metre in height[185]. New growth takes place from April to July. Growth slows considerably as the trees grow older[185]. It is an important forestry tree in N. America and is also planted for timber in N. Europe. It is sometimes used as a ‘Christmas tree’, but is unsuited for this because its leaves quickly fall[226]. Seed production begins at approximately 20 years, though reliable crops make take twice that long[229]. Heavy crops are produced every 2 - 5 years[229]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. There are some named varieties selected for their ornamental value[200]. The crushed leaves are quite aromatic. Some people find the smell distasteful saying that it is like skunks[226], whilst others say it has a pleasant smell like blackcurrants or mouldy grapefruit[185]. Special Features:North American native, Inconspicuous flowers or blooms.

### 3.2.33 Pinus banksiana

Jack Pine

2 tin 7 cyuc 2 ckak 0 tcan 2 dwat 12 m hkuc htut cyutli hgatkuyctup hwicli hyishrasjlt hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus banksiana is an evergreen Tree growing to 12 m (39ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower in May, and the seeds ripen from January to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: Flowers Inner bark SeedEdible Uses: Condiment DrinkSeed - raw or cooked[177]. Rich in oil with a slightly resinous flavour[K]. They are very small and fiddly to utilize, being only 2 - 3mm long[200]. Young cones - cooked[177]. Inner bark[257]. No more information is given, but the bark can usually be eaten raw or cooked. It can also be dried, then ground into a powder and used as a thickener in soups or can be mixed with cereal flours when making bread etc[K]. A refreshing drink is made from the leaves[159, 177]. A vanilla flavouring is obtained as a by-product of other resins that are released from the pulp-wood[200].

tcanta Dye Herbicide String WoodA tan or green dye is obtained from the needles[168]. Various native North American Indian tribes made a string from the long roots of this species and used it to stitch the bark of their canoes[226, 257]. In a sandy soil, the roots of this species extend near the surface of the soil for perhaps 10 metres and are easy to pull out of the ground for their entire length. When gathered, they were made into coils and sunk beneath the surface of water until the outer bark had loosened from the root. They were then peeled and split in half, each half being a serviceable cord for sewing together canoes and bark strips intended for the roofs of wigwams and other purposes[257]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of

all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc[257]. Wood - fairly light, soft, coarse, weak[46, 61, 82, 226]. It weighs 27lb per cubic foot[235]. It is mainly used for fuel, though occasionally also for posts, pulp and lumber[46, 61, 82, 226].

dwatta Antiseptic Diuretic Expectorant Poultice Rubefacient VermifugeThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. A poultice of the inner bark has been used in the treatment of deep cuts[257]. The leaves have been used in a herbal steam bath to clear congested lungs[257]. They have also been used as a fumigant to revive a comatose patient[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Screen. Thrives in a light well-drained sandy or gravelly loam[1]. The trees have an extensive root system and are well adapted for growing in poor sandy soils[11, 226]. They are often used as a pioneer tree for reforestation[226]. Dislikes poorly drained moorland soils and shady positions[1]. Starts away well on almost any soil, whether poorly drained or shallow and dry[185]. Established plants tolerate drought[200]. A fast growing tree when young[200], but growth soon slows down and the tree is short-lived in Britain with no tree known to be older than 75 years[185]. New shoots can be almost 1 metre long, though the tree remains spindly[185]. An open-topped tree, though plants sometimes have a shrubby habit of growth[82]. They can start producing seed when only a few years old[82]. The cones are 4- 5cm long[82]. They ripen in their second year but can remain un-opened on the tree for a number of years, only opening and shedding their seed after a forest fire has heated them to at least 50°C[226]. This makes them one of the first colonizers of burnt land[226]. Cultivated for timber in C. Europe[50]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species hybridises in the wild with the closely related P. contorta where their ranges overlap[226, 270]. There are several named varieties selected for their ornamental value[200]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fun-



is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[46, 105]. Fruit from the typical species is about 1cm in diameter, though there are sub-species and cultivated forms with considerably larger fruits[200]. A sour taste, but the fruit is palatable[2, K]. It is often dried for winter use[61] and also makes an excellent jelly[183].

**tcanta Rootstock**The plant can be used as a rootstock for apple cultivars. It produces a vigorous tree that has more cold tolerance and disease resistance[183]. It is commonly used as stock to graft *Malus pumila* and *M. asiatica* in N and NE China[266]. The sub-species *M. baccata himalaica* is more often used for this purpose. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

**dwatta Anodyne**A paste of the fruit is applied to the forehead to relieve headaches[272].

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

**nwatta Landscape Uses:**Border, Espalier, Pest tolerant, Standard, Specimen, Street tree. An easily grown plant, it succeeds in most fertile soils including heavy ones[1, 98], preferring a moisture retentive well-drained loamy soil[200]. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[200]. A very hardy plant, tolerating temperatures down to about -40°C[160]. The plants are very resistant to disease[34]. This species is cultivated for its edible fruit in China, there are several named varieties[22]. The sub-species *M. baccata mandshurica*. (Maxim.)Schneid. has slightly larger fruits which ripen earlier than the type[1, 200]. Trees can produce fruit in 4 years from seed[160]. A very ornamental tree[1], the fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200]. **Special Features:** Not North American native, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 3.2.32 *Picea glauca*

White Spruce, Black Hills Spruce, Canadian Spruce  
2 tin 6 cyuc 2 kcak 3 tcan 15 nm hkuc  
htut cyutli tcuphja7n hwicli hyishrasjltunykikrip hpa7tli frusflatprik hpa7tmwatli hjonli

**drutta** *Picea glauca* is an evergreen Tree growing to 15 m (49ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can

be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

**kcakta Edible Parts:** Flowers **Inner bark Seed** **Seedpod Uses:** Condiment Gum Tea**Young male catkins** - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are about 5cm long[82]. **Inner bark** - raw or cooked[257]. It can be dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. Usually harvested in the spring[257], it is an emergency food that is only used when all else fails. **Seed** - raw[172]. The seed is about 2 - 4mm long[229] and is too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172]. The trunk yields a gum, used for chewing[183, 257]. Spruce oil, distilled from the leaves and twigs, is used in the food industry to flavour chewing gum, ice cream, soft drinks and sweets[183].

**tcanta Baby care Dye Gum Musical Pitch** **Repellent Shelterbelt String Tannin Waterproofing Wood**A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. The cultivar 'Denstat' has been recommended[200]. The leaves have been burnt to repel insects[257]. Various native North American Indian tribes made a string from the long roots of this species and used it to stitch the bark of their canoes and to make baskets etc[226, 257]. The rotten, dried, finely powdered wood has been used as a baby powder and as a treatment for skin rashes[257]. The bark is a source of tannin[226]. A yellow-brown dye can be obtained from the rotten wood[257]. The pitch obtained from the trunk can be used as a waterproofing sealant in canoes[257]. Wood - straight-grained, resilient, light, soft, not strong. Used for construction and as a source of pulp for paper making[46, 61, 171, 229]. The resonance of the wood, and its capacity to transmit vibrations, make it an ideal wood for guitars, violins, piano soundboards etc[226].

**dwatta Antiseptic Digestive Diuretic Laxative Pectoral Poulitice Salve Skin TB Urinary Vitamin C**White spruce was widely employed medicinally by several native North American Indian tribes, who valued it especially for treating chest complaints[257]. It is little, if at all, used in modern herbalism. An infusion of the cones has been used in the treatment of urinary troubles[257]. The inner bark is pectoral[257]. It has been chewed, and an infusion drunk, in the treatment of TB, influenza, coughs and colds[257]. An infusion is also drunk in the treatment of rheumatism[257]. The inner bark has also been used as a poultice on sores and infected areas, and has also been used to bandage cuts[257]. The tea made from the young shoot tips has antiseptic properties[226]. It is used in the treatment of respiratory infections[257]. A decoction of the stems is used as a herbal steam bath in the treatment of rheumatism[257]. The gum is antiseptic, digestive, laxative, pectoral and salve[257]. A decoction has been used in the treatment of respiratory complaints[257]. The gum obtained from the trunk (probably pitch[K]) has been used as a salve on sores and cuts[257]. A poultice of the gum mixed with oil has been used to treat skin rashes, scabies, persistent scabs, growing boils etc, and has also been used on wounds where there is blood poisoning[257]. The rotten, dried, finely powdered wood has been used as a baby powder and as a treatment for skin rashes[257].

**propta Seed** - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe

no record of the seed being edible, but it contains up to 37% protein and 46% oil[218].

**tcanta Compost Cosmetic Dye Essential Repellent Weather forecasting**The growing plant acts as an insect deterrent[14], it reduces the soil eelworm population[24]. The flowers are used cosmetically. They can be used in skin lotions and when added to hair shampoos will lighten the hair colour[244]. The flowers are an alternative ingredient of 'Quick Return' compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. A yellow dye is obtained from the boiled flowers[2, 4, 46]. An essential oil is obtained from the plant[7]. It is used rather sparingly, in view of the difficulty in obtaining it, in perfumes that have a rather sharp tang[7]. The flowers close when wet weather is likely to occur and they can therefore be used as a rough means of weather forecasting[7].

**dwatta Antiphlogistic Antiseptic Antispasmodic Aperient Astringent Cholagogue Diaphoretic Emmenagogue Homeopathy Skin Stimulant Vulnery WartsPot** marigold is one of the best known and versatile herbs in Western herbal medicine and is also a popular domestic remedy[4, 254]. It is, above all, a remedy for skin problems and is applied externally to bites and stings, sprains, wounds, sore eyes, varicose veins etc[4, 254]. It is also a cleansing and detoxifying herb and is taken internally in treating fevers and chronic infections[4, 254]. Only the common deep-orange flowered variety is considered to be of medicinal value[4]. The whole plant, but especially the flowers and the leaves, is antiphlogistic, antiseptic, antispasmodic, aperient, astringent, cholagogue, diaphoretic, emmenagogue, skin, stimulant and vulnerary[4, 7, 9, 21, 46, 165, 201]. The leaves can be used fresh or dried, they are best harvested in the morning of a fine sunny day just after the dew has dried from them[4]. The flowers are also used fresh or dried, for drying they are harvested when fully open and need to be dried quickly in the shade[4]. A tea of the petals tones up the circulation and, taken regularly, can ease varicose veins[201]. An application of the crushed stems to corns and warts will soon render them easily removable[7]. The leaves, blossoms and buds are used to make a homeopathic remedy[232]. It is used internally in order to speed the healing of wounds[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Calendula officinalis* for inflammation of the mouth and pharynx (throat), wounds and burns(see [302] for critics of commission E).

**propta Seed** - sow in situ from spring to early summer and again in September. The seed germinates best in darkness and usually within 1 - 2 weeks at 21°C[138]. The plant often self-sows freely.

**nwatta Landscape Uses:** Border, Container, Massing, Rock garden. An easily grown plant, it succeeds in any well-drained soil[200, 268], though it prefers a good loam and requires a sunny or at least partially sunny position[4, 15, 200, 268]. Plants flower best when they are grown in a poor soil[108]. Tolerates a pH in the range 4.5 to 8.3. The pot marigold is a very ornamental plant that is commonly grown in the flower garden, and occasionally as a culinary herb, there are some named varieties[183]. When well-sited it usually self-sows freely and will maintain itself if allowed[1, 4]. The flowers are sensitive to variations in temperature and dampness, closing when it is dark and when rain is expected[7, 244]. All parts of the plant are pungently scented[245]. The growing plant attracts hoverflies to the garden, the young of which are fairly efficient eaters of aphids[24, 201]. The flowers are attractive to bees[108]. Marigolds are good companion plants, they grow well with tomatoes[14]. Cucumber mosaic disease and powdery mildew can cause problems with this plant[188]. **Special Features:** Edible, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 3.2.26 *Oxyria digyna*

Mountain Sorrel, Alpine mountainsorrel  
2 tin 8 cyuc 3 kcak 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

**drutta** *Oxyria digyna* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Leaves - raw or cooked[2, 46, 62, 85, 257]. A pleasing acid taste[183] and an excellent potherb[1]. A very nice addition to salads[K]. The leaves can be fermented into a sauerkraut for winter use[183]. Use in moderation, see notes at top of sheet,

**tcanta** None known

**dwatta Antiscorbatic Astringent Dysentery Vitamin C**The leaves are rich in vitamin C and are used to treat scurvy[212]. The roots, stems and leaves are cooked and eaten in the treatment of dysentery[272].

**propta Seed** - sow spring in a cold frame and only just cover the seed. The seed germinates within 2 weeks. It can also be sown as soon as it is ripe, when it germinates within a few days. Prick the seedlings out into individual pots as soon as they are ripe and plant them out into their permanent positions in early summer. Division in the spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** Prefers a moist well-drained rocky soil in a sunny position or partial shade[200]. Requires a lime free soil[200]. There is some controversy here since the plant is said to avoid acid soils in the wild[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 3.2.27 *Vaccinium angustifolium*

Low Sweet Blueberry, Lowbush blueberry  
2 tin 6 cyuc 3 kcak 0 tcan 1 dwat 0.2 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjltut hpa7tli frusflat hpa7tmwatli xre7t hjonli

**drutta** *Vaccinium angustifolium* is a deciduous Shrub growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from May to June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Tea**Fruit** - raw, cooked or used in preserves etc[2, 161, 177, 183]. A very sweet pleasant flavour with a slight taste of honey[11, 43, 183]. Largely grown for the canning industry, it is considered to be the best of the lowbush type blueberries[183]. The fruit can be dried and used like raisins[62]. The fruit is about 12mm in diameter[200]. This is the earliest commercially grown blueberry to ripen[235]. A tea is made from the leaves and dried fruits[101].

**tcanta** None known

**dwatta Blood tonic Oxytoxic**A tea made from the leaves has been used as a blood purifier and in the treatment of infant's colic[22, 257]. It has also been used to induce labour and as a tonic after a miscarriage[222, 257].

**propta Seed** - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed

in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. A very hardy plant, tolerating temperatures down to about -40°c[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Cultivated for its edible fruits, there are some named varieties[1, 183]. It succeeds in cold northerly locations such as Maine in N. America[183] and in C. Sweden. However, it is said to have little or no value as a fruit crop in Britain[11]. The typical species is not as well known as its subspecies *V. angustifolium laevifolium*. House[11]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 3.2.28 Vaccinium angustifolium laevifolium

Low Sweet Blueberry  
2 tin 6 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli frusflat  
hpa7tmwatli xre7t hjonli

drutta Vaccinium angustifolium laevifolium is a deciduous Shrub growing to 0.6 m (2ft) by 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 2. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw, cooked or used in preserves etc[2, 161, 183]. A very sweet pleasant flavour with a slight taste of honey[11, 43, 183]. Largely grown for the canning industry. The fruit can be dried and used like raisins[62]. The fruit is about 12mm in diameter[200]. A tea is made from the leaves and dried fruits[101].

tcanta None known  
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the

last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. A very hardy plant, tolerating temperatures down to about -40°c[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Cultivated for its edible fruits, there are some named varieties[1, 183]. It succeeds in cold northerly locations such as Maine in N. America[183] and in central Sweden. However, it is said to have little or no value as a fruit crop in Britain[11]. This subspecies is more commonly grown in Britain than the typical form[200]. Plants in this genus are notably resistant to honey fungus[200].

### 3.2.29 Larix occidentalis

Western Larch  
2 tin 6 cyuc 2 kcaak 0 tcan 2 dwat 45 m hkuc  
htut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikkwis  
hpa7tmwatli hjonli

drutta Larix occidentalis is a deciduous Tree growing to 45 m (147ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Manna SapEdible Uses: Gum SweetenerA gum, or resin, is produced under the bark. It is a gum arabic substitute, very soluble in water, and is used as a thickening agent, stabilizer, emulsifier and for chewing[183, 226]. It exudes from the trunk and branches but commercially it is usually obtained by extraction from wood chips as a by-product of the lumber industry[142, 161]. The sap can be harvested in the spring and, when concentrated by boiling off much of the water, is made into a sweet syrup[183, 257]. A source of an edible manna[183]. No further details are given, but this report probably refers to the gum mentioned above[K].

tcanta Cosmetic Fuel Gum Paint Tannin WoodA red powder can be made by heating the resin and then grinding it. This powder was mixed with fat and used as a cosmetic, or mixed with balsam poplar buds (*Populus spp.*) and used as a paint[226, 257]. The bark contains tannin[229]. Wood - hard, strong, very heavy, very durable in the soil[82, 226]. The tree produces long straight knotless trunks and is a very important commercial crop in its native range[226]. It is used for posts, cabinet making, construction, plywood etc[46, 61, 171]. A very good fuel[60].

dwatta Antirheumatic Antiseptic Blood purifier Poulitice SalveThe gum obtained from under the bark is used as a dressing in the treatment of cuts and bruises[257]. An infusion of the bark has been used in the treatment of coughs, colds and tuberculosis[257]. A decoction has been used as a wash on wounds and sores[257]. The sap has been chewed in the treatment of a sore throat[257]. The leaves and stems are antirheumatic, antiseptic, appetizer and blood purifier[257]. A decoction has been used both internally and externally in the treatment of cancer, and is said to help an emaciated patient get better and gain weight[257]. A decoction of the stem tips has been taken internally and also used as a soak on arthritic limbs and as a wash for cuts and sores[257].

propta Seed - sow late winter in pots in a cold frame. One month cold stratification helps germination[113]. It is best to give the seedlings light shade for the first year[78]. As soon as they are large enough to handle, prick out the seedlings into individual pots. Although only a few centimetres tall, they can be planted out into their permanent po-

sitions in the summer providing you give them an effective weed-excluding mulch and preferably some winter protection for their first year. Otherwise grow them on in the cold frame for their first winter and plant them out in early summer of the following year. The seed remains viable for 3 years[113] If you are growing larger quantities of plants, you can sow the seed in an outdoor seedbed in late winter. Grow on the seedlings in the seedbed for a couple of years until they are ready to go into their permanent positions then plant them out during the winter.

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional TimberLandscape Uses:Specimen. Prefers an open airy position in a light or gravelly well-drained soil[200]. Plants are intolerant of badly drained soils, but they tolerate acid and infertile soils[200]. Succeeds on rocky hill or mountain sides and slopes[200]. A north or east aspect is more suitable than west or south[1]. This is a very cold-hardy species when fully dormant, but on the whole the trees are a disappointment in Britain. They are often excited into premature growth in this country by periods of mild weather in the winter and are then subject to damage by late frosts and cold winds. They also often suffer from canker and die-back[185]. Good trees, however, can be very good and fast growing, often putting on new annual growth of 1 metre when young[185]. Older trees develop a very thick bark, which protects them from forest fires[226]. Hybridizes freely with other members of this genus[200]. Open ground plants, 1 year x 1 year are the best for planting out, do not use container grown plants with spiralled roots[200]. Plants transplant well, even when coming into growth in the spring[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Wetlands plant, Attractive flowers or blooms.

### 3.2.30 Picea abies

Norway Spruce  
2 tin 7 cyuc 2 kcaak 4 tcan 1 dwat 30 m hkuc  
htut cyutli tcuphja7n hwicli hyishrasjlutnyik hpa7tli frusflat-  
prik hpa7tmwatli hjonli

drutta Picea abies is an evergreen Tree growing to 30 m (98ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure. It cannot tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, used when all else fails. Seed - raw. Rich in oil and with a pleasant slightly resinous flavour, but too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172]. These tips are also used in making spruce beer[183].

tcanta Adhesive Essential Pitch Shelterbelt Tannin Varnish WoodThe tree is a source of pitch (Burgundy pitch) and turpentine (Jura turpentine)[1, 7, 46, 64]. Burgundy pitch is used as a varnish and in medicinal plasters[57]. It is a strong adhesive[61, 64]. The turpentine is a waterproof and wood preservative. They are obtained by incisions in the trunk, the resin is scraped out some months later[64]. An essential oil from the leaves is used in perfumery[46, 61]. The seed contains 30% of a fatty oil, this is used in the production of a varnish[74]. The bark contains some tannin[171]. Both the bark and bark extract have been widely used in Europe as a source of tannin, the bark containing up to 13% tannin[223]. Yields of tannin have been doubled by heating or steaming the bark as soon as possible after the tree has been felled[223]. A fairly wind resistant tree and fast growing, it can be planted in shelterbelts to provide protection from

the wind[200]. The dwarf cultivar 'Inversa' can be grown as a ground cover plant in a sunny position[188]. The cultivars 'Reflexa' and 'Procumbens' can also be used[208]. They are best spaced about 1 metre apart each way[208]. Wood - medium hard, fairly elastic, durable under water, light in weight and colour. Used for general carpentry, joinery, musical instruments etc. Valued for its use in the pulp industry to make paper[1, 11, 13, 46, 66].

dwatta Antibiotic Antiseptic Balsamic Expectorant Poulitice Sedative Vitamin CThe buds, leaves and resin are antibiotic, antiseptic, balsamic, expectorant, sedative[7]. A pitch, or resin, obtained from the trunk is rubefacient and stimulant[240]. It is used externally in plasters etc for its healing and antiseptic properties[7]. A poultice of the sap or gum has been used in the treatment of boil and abscess pain[257].

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Firewood, Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Succeeds in most soils including those that are wet cold and shallow, but it is not very wind-firm in shallow soils[1]. Intolerant of chalky or poor acid soils[11]. Tolerates poor peaty soils[200]. Prefers a pH between 4 to 6[200]. Dislikes shade[200] according to one report whilst another says that it is moderately shade tolerant[125]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree and is tolerant of saline winds[200]. A very cold-hardy tree when fully dormant, though the young shoots are subject to injury by late frosts[1], though less so than *P. sitchensis*[125]. A fast growing tree, it is widely planted in cool temperate zones for its wood[200]. Young trees often grow 1 metre or more a year and can sustain an average of 60cm for at least the first 60 years though growth tails off as they grow older[185]. Probably not that long-lived in Britain, about 200 years seems the absolute maximum[185]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by 'acid rain' pollution[200]. There are many named varieties, almost all of them dwarf forms[200]. A food plant for many caterpillars[30]. A very aggressive tree, it is hostile to other trees[18]. Susceptible to attacks by bark beetles so it should be kept away from more valuable trees. A biological control is being introduced (1983)[125]. This species is susceptible to honey fungus[81]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The seed is shed in spring[1], the cones release their seed whilst they are still on the tree[81]. The bruised leaves emit a delicious musky smell[245]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 3.2.31 Malus baccata

Chinese Crab, Siberian crab apple  
2 tin 7 cyuc 2 kcaak 2 tcan 1 dwat 15 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikprik hpa7tli flatprik-  
kwis hpa7tmwatli fyfjxre7t hjonli

drutta Malus baccata is a deciduous Tree growing to 15 m (49ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It

(has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry to moist soil.

**kcakta Edible Parts:** Flowers Leaves Oil Seed Seedpod  
**Edible Uses:** Gum Oil SweetenerThe following uses have been recorded for *A. speciosa*, it is fairly safe to assume they can also be applied to this closely related species[K]. Flower buds - raw or cooked[61, 92]. Tasting somewhat like peas[85]. Young shoots and leaves - cooked[46, 61, 62, 92, 95]. An asparagus substitute[85, 183]. They should not be eaten raw[85]. Tips of older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long, cooked. Very appetizing[85]. Flower clusters can be boiled down to make a sugary syrup[85] or they can be eaten raw[161, 183]. Seed - raw[161]. A chewing gum can be made from the latex contained in the stem and leaves[46, 61, 92, 183]. Root[183]. No further details.

**tcanta Dye Fibre Gum Latex Oil Paper Pollution Stuffing**The following uses have been recorded for *A. speciosa*, it is fairly safe to assume they can also be applied to this closely related species[K]. A good quality tough fibre is obtained from the bark[92, 99]. It is used in twine, coarse cloth, paper etc[92, 99]. The fibre is 10 - 45mm long[189]. It is easily harvested in late autumn, after the plants have died down, by simply pulling it off the dead stems[168, 169]. When making paper, the stems can be retted by leaving them in the ground until they are dry in the winter or they can be harvested in late summer, the leaves removed and the stems steamed to remove the fibre[189]. The stems are then cooked for two hours with lye and pounded with mallets[189]. The paper colour varies from white to creamy green depending on how the paper is made[189]. If the stems are used in the summer the latex will often find its way onto the fibres and is hard to remove[189]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[168, 169]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[169]. It is very water repellent. The floss has also been used to mop up oil spills at sea. Rubber can be made from latex contained in the leaves and the stems[57, 92, 112]. The yield is up to 3%[112]. Pods contain an oil and a wax which are of potential importance. A green dye is obtained from the flowers and leaves combined[168].

**dwatta Contraceptive Warts**The following uses have been recorded for *A. speciosa*, it is fairly safe to assume they can also be applied to this closely related species[K]. The latex is used as a cure for warts[168]. A tea made from the whole plant has been used as a contraceptive after childbirth[213].

**propta Seed** - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

**nwatta Prefers** a well-drained light rich or peaty soil and a sunny position[1, 134, 200]. This species is closely related to *A. purpurascens*[200]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is

also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

## 4.2.106 *Lonicera villosa*

**Mountain fly honeysuckle, Fuller's honeysuckle**  
3 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

**drutta** *Lonicera villosa* is a deciduous Shrub growing to 1.5 m (5ft) at a slow rate. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or preserved[43, 105, 200]. A milder flavour than most edible honeysuckles, they can be eaten raw but are mainly used in making jams, jellies and refreshing drinks[183]. There is a distinct bitterness in the flavour, even when fully ripe[K].

**tcanta** None known  
**dwatta** None known  
**propta Seed** - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

**nwatta Prefers** a good moist soil in a sunny position, fruiting less well when grown in the shade[200]. Closely related to *L. caerulea*[200]. Polymorphic. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 4.2.107 *Symphytum officinale*

**Comfrey, Common comfrey**  
3 tin 10 cyuc 3 kcaak 4 tcan 5 dwat 1.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

**drutta** *Symphytum officinale* is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Gum TeaYoung leaves - cooked or raw[2, 4, 5, 9, 46, 61]. The leaf is hairy and the texture is mucilaginous. It may be full of minerals but it is not pleasant eating for most tastes. It can be chopped up finely and added to salads, in this way the hairiness is not so obvious[183, K]. Young shoots can be used as an asparagus substitute[46]. The blanched stalks are used[183]. Older leaves can be dried and used as a tea[26]. The peeled roots are cut up and added to soups[183]. A tea is made from the dried leaves and roots[183]. The roasted roots are used with dandelion and chicory roots for making coffee[183].

**tcanta Biomass Compost Gum**The plant grows very quickly, producing a lot of bulk. It is tolerant of being cut several times a year and can be used to provide 'instant compost' for crops such as potatoes. Simply layer the wilted

Apples lose their flavour if they are stored with potatoes[18]. They will also impart a bitter flavour to carrots or potatoes if they are stored in the same area[201]. Growing apples near potatoes makes the potatoes more susceptible to blight[201]. Wrapping maple leaves (*Acer* spp) around apples in store helps to preserve the apples[18, 20]. Apples store better if they are grown in a sward that contains a high percentage of clover[201]. Apple trees grow better and produce better quality fruit when foxgloves (*Digitalis* spp) and wallflowers (*Erysimum cheiri*) are growing in the orchard[201]. Dandelions (*Taraxacum* spp) produce ethylene gas and this can cause earlier ripening of fruit if plants are growing in an orchard[18]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.5 *x Sorbocrataegus hybrid*

**Haw x mountain ash**  
3 tin 8 cyuc 5 kcaak 2 tcan 0 dwat 3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli prik hpa7tmwatli hjonli

**drutta x Sorbocrataegus hybrid** is a deciduous Tree growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Fruit** - raw or cooked[105, 177]. Sub-acid[82]. A delicious flavour, it is sweet with a soft juicy flesh and makes an excellent dessert fruit[K]. It can also be cooked and used in pies, preserves etc and can be dried for later use. The fruit ripens in early September in southern Britain[K]. The fruit is about 2cm in diameter[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood** - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

**dwatta** None known  
**propta Seed** - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta** An interesting and unusual hybrid between *Sorbus aucuparia* (Mountain Ash) and a *Crataegus* (Hawthorn). The foliage is similar to the common mountain ash and turns an attractive red in autumn. The wine-red berries are about the size of a small cherry and are best used to make juice, preserves and sauces. Well-drained but moisture-retentive loamy soil, but they will succeed in most other situations including heavy clays and very chalky soils. Once established they are quite drought tolerant, though they will also tolerate quite wet soils and some species succeed even where the water stands in winter. Many species are also very wind tolerant, some of them succeeding in maritime exposure, and they can be included as part of a shelter-belt planting. They are also tolerant of atmospheric pollution and so grow well in towns, cities, by main roads and industrial estates. For the highest fruit production, it is best to grow the plants in as

sunny a position as possible, though they will also succeed in semi-shade. A position on the sunny edge of a woodland is probably ideal. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 4.2.6 *Rosa rugosa*

**Ramanas Rose, Rugosa rose**  
3 tin 9 cyuc 5 kcaak 3 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli fyfkrx7t hjonli

**drutta** *Rosa rugosa* is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Flowers Fruit Seed Stem**Edible Uses:** TeaFruit - raw or cooked[1, 2, 62]. They are very sweet and pleasant to eat, though it takes quite a bit of patience to eat any quantity[K]. The fruit is a fairly large size for a rose with a relatively thick layer of flesh[K]. The fruit is about 25mm in diameter[200]. Rich in vitamin C[3, 14], containing up to 2.75% dry weight[74]. Some care has to be taken when eating this fruit, see the notes above on known hazards. Flowers - raw or cooked[183]. An aromatic flavour, they are also used in jellies and preserves[74, 183]. Remove the bitter white base of the petals before using them. Young shoots - cooked and used as a potherb[183]. Harvested as they come through the ground in spring and are still tender. The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102]. A pleasant tasting fruity-flavoured tea is made from the fruit, it is rich in vitamin C[21]. A tea is also made from the leaves[218].

**tcanta Hedge Hedge**The plant makes a good low hedge[1, 29]. It is very tolerant of maritime exposure, but is very bare in winter[K].

**dwatta Cancer Hepatic Vitamin C**The leaves are used in the treatment of fevers[218]. The flowers act on the spleen and liver, promoting blood circulation[147, 218]. They are used internally in the treatment of poor appetite and digestion, and menstrual complaints arising from constrained liver energy[238]. The root is used in the treatment of coughs[218]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

**propta Seed.** Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel,

July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Prefers a light well-drained soil but succeeds in most soils including dry ones[11, 14, 200]. Grows well in heavy clay soils[200]. Prefers a circumneutral soil and a sunny position[200]. Dislikes water-logged soils[200]. Tolerates maritime exposure[14, K]. Plants are said to withstand temperatures down to -50°C without damage[160]. The foliage is said to resist disease[11]. A very ornamental plant[1], it suckers freely but these are fairly easily controlled[K]. There are a number of named varieties[11]. 'Scabrosa' is said to be larger in all its parts, including the fruit[200], though it has not proved to be much larger with us[K]. The flowers have a clove-like perfume[245]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Dislikes boxwood[18]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.7 Urtica dioica

Stinging Nettle, California nettle  
3 tlin 10 cyuc 5 koak 4 tcan 5 dwat 1.2 m hkuc  
hmimhtut cyulit tcup hwicli hrasjlyutnyk hpa7tli flatprikliwis  
hpa7tmwalti yanhnjen hjonli

drutta Urtica dioica is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from March to November, in flower from May to October, and the seeds ripen from June to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kaakta Edible Parts: Leaves OilEdible Uses: Colouring Curdling agent Drink OilYoung leaves - cooked as a potherb and added to soups etc[1, 2, 9, 12, 13, 36, 183]. They can also be dried for winter use[12]. Nettles are a very valuable addition to the diet[244], they are a very nutritious food that is easily digested and is high in minerals (especially iron) and vitamins (especially A and C)[4, 201, 238]. Only use young leaves (see the notes above on toxicity) and wear stout gloves when harvesting them to prevent being stung. Cooking the leaves, or thoroughly drying them, neutralizes the sting, rendering the leaf safe to eat[4, 244]. The young shoots, harvested in the spring when 15 - 20cm long complete with the underground stem are very nice[85]. Old leaves can be laxative[5]. The plants are harvested commercially for extraction of the chlorophyll, which is used as a green colouring agent (E140) in foods and medicines[238].

A tea is made from the dried leaves, it is warming on a winters day[21, 183]. A bland flavour, it can be added as a tonic to China tea[238]. The juice of the leaves, or a decoction of the herb, can be used as a rennet substitute in curdling plant milks[183]. Nettle beer is brewed from the young shoots[200].

tcanta Biomass Compost Dye Fibre Hair Liquid feed Oil Repellent WaterproofingA strong flax-like fibre is obtained from the stems[200]. Used for making string and cloth[1, 4, 6, 13, 36], it also makes a good quality paper[115]. It is harvested as the plant begins to die down in early autumn and is retted before the fibres are extracted[4, 99]. The fibre is produced in less abundance than from flax (Linum usitatissimum) and is also more difficult to extract[4]. The plant matter left over after the fibres have been extracted are a good source of biomass and have been used in the manufacture of sugar, starch, protein and ethyl alcohol[4]. An oil obtained from the seeds is used as an illuminant[4]. An essential ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The leaves are also an excellent addition to the compost heap[12, 18, 20] and they can be soaked for 7 - 21 days in water to make a very nutritious liquid feed for plants[54]. This liquid feed is both insect repellent and a good foliar feed[14, 18, 53]. The growing plant increases the essential oil content of other nearby plants, thus making them more resistant to insect pests[18, 20, 54]. Although many different species of insects feed on nettles, flies are repelled by the plant so a bunch of freshly cut stems has been used as a repellent in food cupboard[4]. The juice of the plant, or a decoction formed by boiling the herb in a strong solution of salt, will curdle milks and thus acts as a rennet substitute[4]. This same juice, if rubbed into small seams of leaky wooden tubs, will coagulate and make the tub watertight again[4]. A hair wash is made from the infused leaves and this is used as a tonic and antidandruff treatment[172, 201]. A beautiful and permanent green dye is obtained from a decoction of the leaves and stems[4, 115]. A yellow dye is obtained from the root when boiled with alum[4, 115]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiasthmatic Antidandruff Antirheumatic Antiseborrheic Astringent Diuretic Eczema Galactogogue Haemostatic Hypoglycaemic Stings Tonic UrinaryNettles have a long history of use in the home as a herbal remedy and nutritious addition to the diet[K]. A tea made from the leaves has traditionally been used as a cleansing tonic and blood purifier so the plant is often used in the treatment of hay fever, arthritis, anaemia etc[254]. The whole plant is antiasthmatic, antidandruff, astringent, depurative, diuretic, galactogogue, haemostatic, hypoglycaemic and a stimulating tonic[4, 9, 21, 36, 165, 238]. An infusion of the plant is very valuable in stemming internal bleeding[4], it is also used to treat anaemia, excessive menstruation, haemorrhoids, arthritis, rheumatism and skin complaints, especially eczema[238]. Externally, the plant is used to treat skin complaints, arthritic pain, gout, sciatica, neuralgia, haemorrhoids, hair problems etc[238]. The fresh leaves of nettles have been rubbed or beaten onto the skin in the treatment of rheumatism etc[257]. This practice, called urtification, causes intense irritation to the skin as it is stung by the nettles. It is believed that this treatment works in two ways. Firstly, it acts as a counter-irritant, bringing more blood to the area to help remove the toxins that cause rheumatism. Secondly, the formic acid from the nettles is believed to have a beneficial effect upon the rheumatic joints. For medicinal purposes, the plant is best harvested in May or June as it is coming into flower and dried for later use[4, 238]. This species merits further study for possible uses against kidney and urinary system ailments[222]. The juice of the nettle can be used as an antidote to stings from the leaves and an infusion of the fresh leaves is healing and soothing as a lotion for burns[4]. The root has been shown to have a beneficial effect upon enlarged prostate glands[254]. A homeopathic remedy is made from the leaves[4]. It is used in the treatment of rheumatic gout, nettle rash and chickenpox, externally is applied to bruises[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Urtica dioica Stinging Nettle for rheumatic ailments (internal use of leaf), irrigation therapy, for inflammatory disease of the lower

like broccoli[183]. Flowers and young flower buds - cooked. They have a mucilaginous texture and a pleasant flavour, they can be used as a flavouring and a thickener in soups etc[55, 102, 257]. The flower clusters can be boiled down to make a sugary syrup[2, 85]. The flowers are harvested in the early morning with the dew still on them[95]. When boiled up they make a brown sugar[95]. Young shoots - cooked. An asparagus substitute[2, 4, 43, 55, 62, 95, 183]. They should be used when less than 20cm tall[159]. A slightly bitter taste[159]. Tips of older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long, cooked[2, 43, 55, 85]. They are very appetizing. Best used when about 2 - 4cm long and before the seed floss forms, on older pods remove any seed floss before cooking them[85, 159]. If picked at the right time, the pods resemble okra[183]. The sprouted seeds can be eaten[183]. An edible oil is obtained from the seed[55, 171]. The latex in the stems is a suitable replacement for chicle and can be made into a chewing gum[46, 61, 269]. It is not really suitable for use in tyres[269]. The latex is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112].

tcanta Adhesive Fibre Gum Latex Oil Pollution Stuffing WickA good quality fibre is obtained from the inner bark of the stems. It is long and quite strong, but brittle[269]. It can be used in making twine, cloth, paper etc[95, 112, 169]. The fibre is of poor quality in wet seasons[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. It is estimated that yields of 1,356 kilos per hectare could be obtained from wild plants[269]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[112, 159, 169, 171]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[112]. Very water repellent, it can yield up to 550 kilos per hectare[112]. The floss absorbs oil whilst repelling water and so has also been used to mop up oil spills at sea. Candlewicks can be made from the seed floss[112, 207]. In cultivation, only 1 - 3% of the flowers produce mature pods[269]. It is estimated that yields of 1,368 kilos per hectare could be obtained from wild plants[269]. Rubber can be made from latex contained in the leaves and the stems[46, 57, 102, 159]. It is found mainly in the leaves and is destroyed by frost[112]. Yields of 197 kilos per hectare can be expected from wild plants, it is estimated that by selection these yields could be increased to 897 kilos[269]. Yields are higher on dry soils[112]. The latex can also be used as a glue for fixing precious stones into necklaces, earrings etc[257]. The latex contains 0.1 - 1.5% caoutchouc, 16 - 17% dry matter, and 1.23% ash. It also contains the digitalis-like mixture of a- and b-asclepiadin, the antitumor b-sitosterol, and a- and b-amyrin and its acetate, dextrose and wax[269]. Pods contain an oil and a wax which are of potential importance. The seed contains up to 20% of an edible semi-drying oil[74, 112]. It is also used in making liquid soap[74]. The dogbane-milkweed family Asclepias, Apocynum, Calotropis, and Trachomitum spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed finer or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

dwatta Anodyne Contraceptive Diaphoretic Diuretic Emetic Expectorant Homeopathy Purgative WartsThe root is anodyne, diaphoretic, diuretic, emetic, expectorant and purgative[4, 21, 222]. It has been used in the treatment of asthma, kidney stones, venereal disease etc[254, 257]. Caution is advised, see the notes above on toxicity. An infusion of the pounded roots has been used by the women of some native North American Indian tribes to promote temporary sterility[213, 257]. The leaves and/or the latex are used in folk remedies for treating cancer and tumours[269]. The milky latex from the stems and leaves is used in the treatment of warts[4, 159, 222, 257]. The latex needs to be applied at least daily over a period of up to a few weeks to be effective. The stems can be cooked and applied as a poultice on rheumatic joints[257]. One reported Mohawk antifertility concoction contained milkweed and jack-in-the-pulpit, both considered contraceptive. Dried and pulverized, a fistful of milkweed and three Arisaema rhizomes were infused in a pint of water for 20 minutes. The infusion was drunk, a cupful an hour, to induce temporary sterility[269]. The rhizome is used in homeopathy as an antioedemic and emmenagogue in the

treatment of dropsy and dysmenorrhoea[269].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Experimental Crop Industrial Crop: Fiber Industrial Crop: Hydrocarbon Management: Hay-Succeeds in any good soil[187]. Prefers a well-drained light rich or peaty soil[1, 200]. Requires a moist peaty soil and a sunny position[111, 134]. Plants are hardy to about -25°C[187]. A very ornamental plant[1], though it can be invasive by means of its spreading root system[200]. The flowers diffuse a delicious scent into the garden. This scent attracts bees, who obtain copious supplies of nectar from the plants[50, 74, K], though unfortunately the plants do not always flower in Britain[K]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. This plant has a very wide range of uses and merits attention as a food, fibre and rubber crop[K]. It was possibly cultivated at one time by the North American Indians for its many uses[159]. It is considered by some to be the greatest underachiever among plants. Its potential appears great, yet until now it has never been continuously processed for commercial purposes[269]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. Special Features:North American native, Invasive, Naturalizing, Attracts butterflies, Fragrant flowers. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.105 Asclepias hallii

Purple Silkweed, Hall's milkweed  
3 tlin 7 cyuc 3 koak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyulit kyuctcup hwicli hrasjlyut hpa7tli flatprikliwis  
hpa7tmwalti fyfxre7t hjonli

drutta Asclepias hallii is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August, and the seeds ripen in September. The species is hermaphrodite

ing wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

**kcakta Edible Parts:** Flowers Leaves Root**Edible Uses:** Condiment TeaAll parts of the plant are edible. Root - cooked[2, 141]. Young leaves - cooked as a flavouring in soups[177]. Young leaves, flowers and roots are brewed into a tea[183]. The dried leaves are used as a flavouring[12, 100], especially as a sweetener in herb teas[13, 183]. The flowers are used as a flavouring in various alcoholic beverages and in stewed fruits[183]. Adding them to wine or beer is said to make a very heady brew[244]. They are also made into a syrup which can be used in cooling drinks and fruit salads[183].

**tcanta Dye Essential Pot-pourri** StrewingA black dye is obtained from the roots. It is brown[141]. A yellow dye is obtained from the plant tops[106]. An essential oil obtained from the flower buds is used in perfumery[46, 61]. The whole plant, but especially the leaves[245], was formerly used as a strewing herb, imparting an almond-like fragrance[4, 66]. Strongly aromatic, its delightful perfume would completely fill the room[244]. Both flowers and leaves have been used in pot-pourri, retaining their scent for several months. The scent of the dried flowers becoming more and more pleasant with age[245].

**dwatta Alterative Antiinflammatory Antirheumatic Antiseptic Aromatic Astringent Diaphoretic Diuretic Dysentery Homeopathy Stomachic TonicMeadowsweet** has a very long history of herbal use, it was one of the three most sacred herbs of the Druids[238]. The leaves and flowering stems are alterative, anti-inflammatory, antiseptic, aromatic, astringent, diaphoretic, diuretic, stomachic and tonic[4, 9, 21, 165]. The plant is harvested in July when it is in flower and can be dried for later use[4]. The flower head contains salicylic acid, from which the drug aspirin can be synthesised[200, 238]. Unlike the extracted aspirin, which can cause gastric ulceration at high doses, the combination of constituents in meadowsweet act to protect the inner lining of the stomach and intestines whilst still providing the anti-inflammatory benefits of aspirin[254]. The herb is a valuable medicine in the treatment of diarrhoea, indeed it is considered almost specific in the treatment of children's diarrhoea[4]. It is also considered to be a useful stomachic, being used to treat hyperacidity, heartburn, gastritis and peptic ulcers, for which it is one of the most effective plant remedies[4, 238]. It is also frequently used in the treatment of afflictions of the blood[4]. Meadowsweet is also effective against the organisms causing diphtheria, dysentery and pneumonia[238]. This remedy should not be given to people who are hypersensitive to aspirin[238]. A strong decoction of the boiled root is said to be effective, when used externally, in the treatment of sores and ulcers[244]. A homeopathic remedy is made from the fresh root[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Filipendula ulmaria* Meadowsweet for cough, bronchitis, fever and cold (see [302] for critics of commission E).

**propta Seed - best sown in the autumn in a cold frame**[1]. The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta Landscape Uses:**Border, Massing, Rock garden, Seashore, Specimen, Woodland garden. Requires a humus-rich moist soil in semi-shade[200]. Succeeds in full sun only if the soil is reliably moist throughout the growing season[200]. Dislikes dry or acid soils[1, 17]. Does well in marshy soils[24, 200]. Grows well in heavy clay soils. The flowers have a strong sweet smell[4], which for many people is sickly[245]. The leaves are also aromatic[187], though the scent is very different from the flowers[4]. The leaves are pleasantly aromatic[245]. A good bee plant[24, 30]. Members of this genus are rarely if ever troubled by browsing deer[233]. **Special Features:**Attractive foliage, Edible, Fragrant foliage, Not North American native, Naturalizing, Suitable for cut flower

ers, Suitable for dried flowers, Fragrant flowers.

## 4.2.103 Cleome serrulata

**Rocky Mountain Beeplant**

3 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 1 m hkuc  
hmmihmtu cyutli kyuctcup hwicli hrasjlut hpa7tli fatprlikwiv  
hpa7tmwatli xre7t hjonli

**drutta Cleome serrulata** is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Leaves Seed Seedpod**Edi Uses:** Young shoots, leaves and flowers are cooked and used as potherbs[46, 105, 161, 183]. The plants were gathered and, after removing an alkaline taste[46], were eaten with cornmeal porridge[61, 183]. The plant smells like a skunk, but it was an important potherb for the native North American Indians and the early European settlers in America[207]. Seed - raw or cooked[257]. It can be dried and ground into a meal then used as a mush or mixed with flour to make bread etc[85, 183, 207, 257]. Seedpods - cooked[183]. The hardened cakes of dyestuff (see note on the plants other uses) can be soaked in hot water and then eaten fried[207].

**tcanta Deodorant Dye**A black dye is obtained[46, 61, 85] by boiling down the whole plant[95]. It is used as a paint for decorating pottery[207]. The young plants are harvested in mid-summer, boiled well in water, the woody parts of the plant are removed and the decoction is boiled again until it becomes thick and turns black. This thick liquid is then poured onto a board to dry in cakes and can be kept for an indefinite period. When needed it is soaked in hot water until the correct consistency for paint is achieved[207]. A decoction of the leaves has been used as a body and shoe deodorant[257].

**dwatta Deodorant Febrifuge**An infusion of the plant is drunk in the treatment of fevers and stomach disorders[213, 257]. A poultice made from the pounded, soaked leaves has been applied to sore eyes[257].

**propta Seed - surface sow or only lightly cover the seed in spring in a greenhouse**[164]. The seed usually germinates in 5 - 14 days at 25°C[164]. When large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. Day time temperatures below 20°C depress germination but a night time fall to 20° is necessary[164].

**nwatta** Prefers a light fertile soil in a warm dry sunny position with plenty of room to spread[200]. A frost tender plant, it can be grown as a summer annual in Britain[200]. A very good bee plant, it is often planted by apiarists in America[207]. This plant was probably cultivated by the N. American Indians[85]. The Indians would allow the plant to produce seed when it was growing wild in the cornfields in order to ensure a supply the following year[216].

## 4.2.104 Asclepias syriaca

**Common Milkweed, Silkweed, Milkweed**

3 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 1 m hkuc  
hmmihmtu cyutli kyuctcup hwicli hrasjlut hpa7tli fatprlikwiv  
hpa7tmwatli xre7t hjonli

**drutta Asclepias syriaca** is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Leaves Oil Seed **See Uses:** Gum Oil Oil SweetenerUnopened flower buds - cooked. They taste somewhat like peas. They are used

urinary tract and prevention of kidney 'gravel' formation, urination difficulty from benign prostatic hyperplasia (root) (see [302] for critics of commission E).

**propta Seed - sow spring in a cold frame, only just covering the seed.** Prick out the seedlings into individual pots when they are large enough to handle, and plant them out in the summer. Division succeeds at almost any time in the growing season. Very easy, plant them straight out into their permanent positions.

**nwatta Industrial Crop: Fiber Management: Hay Regional Crop Staple Crop: Protein**Prefers a soil rich in phosphates and nitrogen. Plants must be grown in a deep rich soil if good quality fibre is required[4, 115]. Nettles are one of the most undervalued of economic plants. They have a wide range of uses, for food, medicines, fibres etc and are also a very important plant for wildlife. There are at least 30 species of insects that feed on it and the caterpillars of several lepidoptera species are dependant upon it for food[30]. Especially when growing in rich soils, the plant can spread vigorously and is very difficult to eradicate. It is said that cutting the plant down three times a year for three years will kill it[4]. It is a good companion plant to grow in the orchard and amongst soft fruit[53, 54]. So long as it is not allowed to totally over-run the plants, it seems to improve the health of soft fruit that grows nearby and also to protect the fruit from birds, but it makes harvesting very difficult. Dioecious. Male and female plants must be grown if seed is required. The plant is heat tolerant in zones 10 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.8 Althaea officinalis

**Marsh Mallow, Common marshmallow**

3 tin 7 cyuc 5 kcaak 3 tcan 5 dwat 1.2 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli fatprlikwiv  
som hpa7tmwatli fyfxre7t hjonli

**drutta Althaea officinalis** is a PERENNIAL growing to 1.2 m (4ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Leaves Oil Root**Edible Uses:** Egg Oil TeaLeaves - raw or cooked[2, 4, 100]. They are used as a potherb or to thicken soups[62, 183]. When used as a small proportion with other leaves, the taste and texture is acceptable, but if a lot of the leaves are cooked together their mucilaginous texture makes them unpalatable[K]. The leaves can be eaten raw but are rather fibrous and somewhat hairy, though the taste is mild and pleasant[K]. We have found them to be quite acceptable in salads when chopped up finely[K]. Root - raw or cooked[61]. When boiled and then fried with onions it is said to make a palatable dish that is often used in times of shortage[4]. The root is used as a vegetable[62, 141, 183], it is also dried then ground into a powder, made into a paste and roasted to make the sweet 'marshmallow'[4, 5, 7, 17, 61]. The root contains about 37% starch, 11% mucilage, 11% pectin[254]. The water left over from cooking any part of the plant can be used as an egg-white substitute in making meringues etc[62]. The water from the root is the

most effective[183], it is concentrated by boiling until it has a similar consistency to egg white. A tea is made from the flowers[183]. A tea can also be made from the root[183].

**tcanta Adhesive Fibre Oil Teeth**The dried root is used as a toothbrush or is chewed by teething children[6, 7]. It has a mechanical affect on the gums whilst also helping to ease the pain. The root is also used as a cosmetic, helping to soften the skin[7]. A fibre from the stem and roots is used in paper-making[46, 61, 74, 115]. The dried and powdered root has been used to bind the active ingredients when making pills for medicinal use[268]. A glue can be made from the root[74]. The root is boiled in water until a thick syrup is left in the pan, this syrup is used as a glue. An oil from the seed is used in making paints and varnishes[74].

**dwatta Anti diarrhoeal Antispasmodic Demulcent Diuretic Emollient Laxative Odontalgic UrinaryMarsh mallow** is a very useful household medicinal herb. Its soothing demulcent properties make it very effective in treating inflammations and irritations of the mucous membranes such as the alimentary canal, the urinary and the respiratory organs[4, 254]. The root counters excess stomach acid, peptic ulceration and gastritis[254]. It is also applied externally to bruises, sprains, aching muscles, insect bites, skin inflammations, splinters etc[4, 238]. The whole plant, but especially the root, is antitussive, demulcent, diuretic, highly emollient, slightly laxative and odontalgic[4, 17, 21, 46, 165]. An infusion of the leaves is used to treat cystitis and frequent urination[254]. The leaves are harvested in August when the plant is just coming into flower and can be dried for later use[4]. The root can be used in an ointment for treating boils and abscesses[254]. The root is best harvested in the autumn, preferably from 2 year old plants, and is dried for later use[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Althaea officinalis* Marsh Mallow for irritation of mouth and throat and associated dry cough/bronchitis (Root and leaf), mild stomach lining inflammation (root) (see [302] for critics of commission E).

**propta Seed - sow spring or autumn in a cold frame.** The seed is best sown as soon as it is ripe in late summer, the germination is often erratic[238]. Stratification can improve germination rates and time. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer[K]. Division in spring or autumn. Fairly easy, it is best to pot up the divisions in a lightly shaded position in a cold frame or greenhouse until they are growing away well and then plant them out into their permanent positions. Root cuttings in December.

**nwatta Succeeds in almost any soil and situation**[1, 4, 200], though it prefers a rich moist soil in a sunny position[4, 200]. It also tolerates fairly dry soil conditions[1]. Plants are hardy to about -25°C[187]. Marsh mallow is often cultivated in the herb garden, as a culinary and medicinal herb as well as for ornament[61]. Its roots were at one time the source of the sweet 'marsh mallow', but this sweet is now made without using the plant[4]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.9 Secale strictum kuprijanovii

3 tin 7 cyuc 5 kcaak 0 tcan 0 dwat 1.2 m hkuc  
htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli fatprlikwiv  
hpa7tmwatli xre7t hjonli

**drutta Secale strictum kuprijanovii** is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is

hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

**kcka**ta Edible Parts: Seed**Edible Uses:** Seed - used as a whole grain or ground into a flour and used for making bread etc[46, 177, 183]. Somewhat smaller than the seed of *S. cereale* but produced abundantly. It is relatively difficult to extract the seed from the glumes by hand[K].

tcanta None known

dwatta None known

**propta** Seed - sow March or October in situ and only just cover the seed. Germination should take place within 2 weeks. If the seed is in short supply, it can be grown in pots in the greenhouse or cold frame in early spring. Only just cover the seed. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

**nwatta** Succeeds in most soils but prefers a well-drained light soil in a sunny position[1]. One report says that it requires protection from severe frosts[1], though our experience is that it is hardy in most parts of the country[K]. Occasionally cultivated for its edible seed[61], it is possibly a parent of the cultivated Rye, *S. cereale*[57]. This species has an excellent potential as a perennial cereal crop in temperate zones. Although the seed is somewhat smaller than the cultivated annual rye, it is produced abundantly, especially from the second year onwards. The plant tillers well, especially in its second and subsequent years, and the ears in selected varieties can be 25cm long[K]. This subspecies is reliably perennial[46].

## 4.2.10 Hemerocallis fulva

Common Day Lily, Orange daylily, Tawny Daylily, Double Daylily

3 tlin 10 cyuc 5 keak 2 tcan 2 dwat 1 m hkuc  
hmimhtut cyutil kyuctup hwicli hrsajlutnykfrrip hpa7tli flat-prikliws hpa7tmwatli dyatkre7t hjonli

**drutta** *Hemerocallis fulva* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcka**ta Edible Parts: Flowers **Leaves** **Root** **Shoots****Edible Uses:** Leaves and young shoots - cooked[85, 116, 179, 183]. An asparagus or celery substitute. An excellent sweet tasting vegetable[179, K], though some caution is recommended[127, 137]. The leaves need to be eaten whilst still very young since they quickly become fibrous[K]. Flowers - raw or cooked[62, 100]. The petals are thick and crunchy, making very pleasant eating raw, with a nice sweetness at the base because of the nectar[K]. The flowers can also be dried and used as a thickener in soups etc[62, 183]. In this case, they are picked when somewhat withered and closed[85]. A rich source of iron[218]. Flower buds - raw or cooked[62, 100, 105, 116]. A pea-like flavour[85]. Can be dried and used as a relish[178]. The dried flower contains about 9.3% protein. 25% fat!?, 60% carbohydrate (rich in sugar), 0.9% ash. It is rich in vitamin A[179]. Tubers - raw or cooked[183]. A nutty flavour[62]. Young tubers are best, though the central portion of older tubers is also good[85].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Plants form a spreading clump and are suitable for ground cover when spaced about 90cm apart each way[208]. The dead leaves should be left on the ground in the winter to ensure effective cover[208]. The cultivar ‘Kwanso Flore Pleno’ has been especially mentioned[208].

dwatta **Anodyne** **Anthelmintic** **Antidote** **Antiemetic** **Antispasmodic** **Blood purifier** **Cancer** **Depurative** **Diuretic** **Febrifuge** **Laxative** **Sedative** **Diuretic**, febrifuge, laxative (mild)[62, 178, 205]. The flowers are anodyne, antiemetic, antispasmodic, depurative, febrifuge and sedative[218]. In China they are used as an anodyne for women in childbirth[240]. An extract of the flowers is used as a blood purifier[240]. The rhizome has shown antimicrobial activity, it is also tuberculostatic and has an action against the parasitic worms that cause filariasis[279]. It is used in Korea to treat opilation, jaundice, constipation and pneumonia[279]. The juice of the roots is an effective antidote in cases of arsenic poisoning[205]. The root also has a folk history of use in the treatment of cancer - extracts from the roots have shown antitumour activity[218]. A tea made from the boiled roots is used as a diuretic[205, 218].

**propta** Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** **Landscape** **Uses:**Border, Erosion control, Ground cover, Massing. Succeeds in most soils[1], including dry ones, though it prefers a rich moist soil[111] and a sunny position but tolerating partial shade[88, 111]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. This species is hardy to about -20°C[187]. Plants take a year or two to become established after being moved[200]. The roots have spindle-shaped swellings and spread freely, the plant can become invasive[205]. A very ornamental plant[1], it is cultivated in China and Japan for its edible flowers and leaves, there are many named varieties[200]. Individual flowers are short-lived, opening in the morning and withering in the evening. The plant, however, produces a succession of flowers over a period of about 6 weeks[205]. The sterile cultivar ‘Kwanso’ has double flowers, it has been especially mentioned for these flowers which are said to be crunchy with a nutty aftertaste[137]. ‘Flore Pleno’ is another form with double-flowers that have a delicious taste[K]. The sterile cultivar ‘Europa’ is very vigorous, with long stolons, and each piece of root is capable of growing into a new plant[205]. This cultivar, which is the form usually supplied from nurseries, succeeds in lawns and has even been known to grow through tarmac[205]. Hybridizes freely with other members of this genus[200]. Many forms of this plant are sterile triploids, probably of garden origin, and do not set seed[205]. The pollen, however, is fertile and can be used to fertilize other plants[205]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. **Special Features:** Naturalizing, Attracts butterflies, Suitable for cut flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 12 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

(Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcka**ta Edible Parts: Leaves **Root****Edible Uses:** Leaves and young shoots - raw or cooked[85, 177]. Rich in vitamin C. A pleasant mild flavour[K]. Root - raw or cooked[2, 105, 177]. A nut-like flavour, very palatable[85]. The young roots are best[85]. Somewhat sweet, they are a pleasant addition to the salad bowl[183].

tcanta None known

dwatta **Vitamin C**The plant has been used as a cure for hydrophobia in Russia[271].

**propta** Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. Easy[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[200]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy, any part of the root will produce a new plant[221].

**nwatta** An easily grown plant succeeding in almost any soil[221], though it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. It is slower growing and less spreading when grown in heavier soils[271]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. A beautiful plant, it was at one time cultivated as a culinary plant but has fallen into disuse[4]. The plant produces a mass of thick white roots which can spread at an alarming rate, especially in light soils. It can often fill an entire bed with its tenaceous roots, killing off less vigorous plants[271]. It is best grown in the wild garden where it can be allowed to romp without harm[221, 271]. Plants can also succeed when growing in thin grass[233]. Plants produce seed freely and often self-sow[221]. Slugs are very attracted to this plant, we have had great problems growing it on our Cornish trial grounds because the slugs eat out all the new shoots in spring and can kill even well-established specimens[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.101 Nepeta cataria

Catmint, Catnip

3 tlin 7 cyuc 3 keak 0 tcan 2 dwat 1 m hkuc  
htut cyutil kyuctup hwicli hrsajlut hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

**drutta** *Nepeta cataria* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to November, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcka**ta Edible Parts: Leaves**Edible Uses:** Condition TeaYoung leaves - raw[7, 20]. A mint-like flavour, they make an aromatic flavouring in salads[7, K]. Older leaves are used as a flavouring in cooked foods[2, 27, 105]. They can be used fresh or dried to make an aromatic herb tea[21, 105, 183]. The tea should be infused in a closed container in order to preserve the essential oils, boiling is said to spoil it[218].

tcanta **Essential Herbicide** **Pot-pourri** **Repellent**The plant is said to deter insects such as ants and flea beetles[14, 20, 201] as well as rats and mice[4, 200, 201]. (The idea behind it being a rat repellent is probably based on the plants attraction to cats, see notes above.) A strong infusion can be used to repel fleas from carpets or the fur of animals[201]. An extract from the leaves (called nepetalactone) has herbicidal and insect repellent properties[222]. The freshly har-

vested flowering tops contain 0.3 - 1% essential oil by distillation[218]. It is mainly used for medicinal purposes[218]. The dried leaves retain their fragrance and can be used in pot-pourri[245].

dwatta **Antianxiety** **Antispasmodic** **Antitussive** **Astringent** **Carminative** **Diaphoretic** **Emmenagogue** **Nervine** **Refrigerant** **Sedative** **Stimulant** **Stomachic** **Tonic**Catmint has a long history of use as a household herbal remedy, being employed especially in treating disorders of the digestive system and, as it stimulates sweating, it is useful in reducing fevers[254]. The herbs pleasant taste and gentle action makes it suitable for treating colds, flu and fevers in children. It is more effective when used in conjunction with elder flower (*Sambucus nigra*)[254]. The leaves and flowering tops are strongly antispasmodic, antitussive, astringent, carminative, diaphoretic, slightly emmenagogue, refrigerant, sedative, slightly stimulant, stomachic and tonic[4, 7, 9, 14, 21, 165, 218, 238]. The flowering stems are harvested in August when the plant is in full flower, they are dried and stored for use as required[4]. An infusion produces free perspiration, it is considered to be beneficial in the treatment of fevers and colds[4]. It is also very useful in the treatment of restlessness and nervousness, being very useful as a mild nervine for children[4]. A tea made from the leaves can also be used[213]. The infusion is also applied externally to bruises, especially black eyes[245].

**propta** Seed - best sown as soon as it is ripe in a cold frame in the autumn[200]. The germination of spring sown seed can be erratic[200], it is best sown in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. The seed remains viable for about 5 years[4]. A fast-growing plant, the seedlings can reach flowering size in their first year[238]. If you have sufficient freshly ripe seed then it is well worth trying a sowing outdoors in situ in the autumn. Division in spring or autumn[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in late spring or early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta** Easily grown in a light sandy soil in a sunny position[200]. Succeeds in heavier soils if the drainage is very good. Plants are hardy to about -25°C[187]. Catmint emits a scent that is irresistible to many cats, who will then avidly attack the plant[4, 7, 20, 46, 200]. The smell is said to be similar to certain cat hormones and is more effective with male cats. Quite often a cat will completely destroy even a fairly large plant, small plants especially might need protection until well established[K]. Sometimes grown in the herb garden, there are some named varieties[183]. ‘Citriodora’ has lemon-scented leaves that are more attractive to people and less attractive to cats[183, 187]. If the plants are cut back hard when they are flowering a second crop of leaves will be produced[238]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Catmint is a good companion plant to grow in the garden[238]. It is said to repel various cabbage pests, aphid (including peach aphid), flea beetles, cucumber beetles, squash bugs and ants from plants they grow near to[238]. The flowers are very attractive to bees[108].

## 4.2.102 Filipendula ulmaria

Meadowsweet, Queen of the meadow, Double Lady of the Meadow, European Meadowsweet

3 tlin 9 cyuc 3 keak 3 tcan 3 dwat 1.2 m hkuc  
hmimhtut cyutil tuchhja7n hwicli hrsajlutnykfrrip hpa7tli prikliws hpa7tmwatli fyfykre7t hjonli

**drutta** *Filipendula ulmaria* is a PERENNIAL growing to 1.2 m (4ft) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attract-



root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Special Features:North American native, Edible, Inconspicuous flowers or blooms.

## 4.2.98 Rubus strigosus

American Red Raspberry, Grayleaf red raspberry

3 tlin 7 cyuc 3 kcak 1 tcan 3 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta Rubus strigosus is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Fruit StemEdible Uses: TeaFruit - raw or cooked in pies, preserves etc[1, 2, 3, 34, 85, 101, 183]. Young shoots - harvested as they emerge through the ground in the spring, peeled and eaten raw or cooked like asparagus[85, 101, 161, 183]. The leaves and twigs are used as a tea substitute[161, 183].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta Antiemetic Astringent Birthing aid Cardiac Decongestant Oxytoxic Refrigerant StimulantAntiemetic[13, 165]. The leaves and roots are anti-inflammatory, astringent, decongestant, ophthalmic, oxytocic and stimulant[4, 13, 165, 222, 254]. A tea made from them is used in the treatment of diarrhoea, as a tonic for the uterus to strengthen pregnant women, and as an aid in childbirth[4, 222, 257]. The tea has also been shown as effective in relieving painful menstrual cramps[222]. The active ingredients both stimulate and relax the uterus[222]. They can be used during the last three months of pregnancy and during childbirth, but should not be used earlier[238]. Externally, the leaves and roots are used as a gargle to treat tonsillitis and mouth inflammations, as a poultice and wash to treat sores, conjunctivitis, minor wounds, burns and varicose ulcers[238, 257]. The leaves are harvested in the summer and dried for later use[9]. The fruit is antiscorbutic and diuretic[7]. Fresh raspberry juice, mixed with a little honey, makes an excellent refrigerant beverage to be taken in the heat of a fever[21]. Made into a syrup, it is said to have a beneficial effect on the heart[21].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. A parent of some of the cultivated raspberries[1, 34], it is often used in modern breeding programmes[119]. This species has biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.99 Rubus parviflorus

Thimbleberry

3 tlin 7 cyuc 3 kcak 3 tcan 3 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rubus parviflorus is a deciduous Shrub growing to 2.5 m (8ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Flowers Fruit StemEdible Uses: Fruit - raw or cooked[62, 101, 118, 183]. It makes excellent jams and preserves[257]. The fruit can also be dried for later use[183]. A sweet and pleasant flavour[2, 85, 94] though this is not always properly developed in the cooler summers of Britain[11]. The fruit is very seedy[155]. Rich in vitamin C[183]. The hemispherical fruit is about 20mm in diameter[200]. Young shoots - peeled and eaten cooked or raw[2, 85, 101, 118, 172]. The shoots are harvested as they emerge in the spring, and whilst they are still young and tender[161, 183]. They can be cooked like asparagus[257]. The shoots are rich in vitamin C[183]. Flowers - raw[172].

tcanta Dye Lining SoapThe leaves are used to line baskets etc for carrying soft fruit or other delicate items[99, 118]. Plants are very vigorous and can be grown as a tall ground cover for large areas[208]. A soap is obtained from the boiled bark[99, 118, 257]. A purple to dull blue dye is obtained from the fruit[168].

dwatta Antiemetic Antiphlogistic Appetizer Astringent Blood tonic Dysentery Poultice Salve Stomachic Tonic Vitamin C Women's complaintsThe leaves are antiemetic, astringent, blood tonic and stomachic[172, 257]. An infusion is used internally in the treatment of stomach complaints, diarrhoea and dysentery, anaemia, the spitting up of blood and to treat vomiting[238, 257]. An infusion has been taken by women when their periods are unusually long[257]. A poultice of the dried powdered leaves has been used to treat wounds and burns[257]. The leaves have been crushed and rubbed over the skin to treat pimples and blackheads[257]. A poultice of the leaf ashes, mixed with oil, has been used to treat swellings[257]. The young shoots are alterative and antiscorbutic[257]. The roots are appetizer, astringent, stomachic and tonic[172, 257]. An infusion has been used by thin people to help them gain weight[257]. An infusion has also been used in the treatment of stomach disorders, diarrhoea and dysentery[238, 257]. A decoction of the roots has been taken in the treatment of pimples and blackheads[257].

propta Seed - requires stratification, is best sown in early autumn in a cold frame. Sow stored seed as early as possible in the year in a cold frame and stratify for a month at 3°C if sowing later than February. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Tip layering in July. Plant out in autumn. Division in early spring.

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Can be grown in a woodland garden though it is less likely to fruit well in such a position[K]. This plant has perennial stems without prickles[200] and is less invasive than the related *R. odoratus*[182]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.100 Campanula rapunculoides

Creeping Bellflower, Rampion bellflower

3 tlin 7 cyuc 3 kcak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli priklwis hpa7tmwatli fyfxre7t hjonli

drutta Campanula rapunculoides is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera

## 4.2.11 Lepidium spp.

Perennial Lepidium

3 tlin 10 cyuc 5 kcak 0 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Lepidium spp. is a PERENNIAL growing to 1.2 m (4ft) by 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves RootEdible Uses: Carbon Farming Solutions - Staple Crop: oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. Fruit is usually spreading and squat (less than 3 times as long as broad),

tcanta See individual species.

dwatta Various medicinal qualities depending on the species.

propta See individual species.

nwatta Management: Standard Staple Crop: Oil Under DevelopmentClimate: boreal to warm temperate. Humidity: semi-arid to humid. A genus of plants in the mustard/cabbage family, Brassicaceae. Annual to perennial, herbs or shrubs. Species include garden cress, maca, and dattander. Lepidium is from the Greek *lepis* (scallop) referring to the shape of the seed pods. Carbon Farming Solutions - Cultivation: under development. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 4.2.12 Secale hybrids

Perennial cereal rye

3 tlin 9 cyuc 5 kcak 4 tcan 1 dwat 1.8 m hkuc htut cyutli hgtattcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Secale hybrids is a PERENNIAL growing to 1.8 m (6ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: Oil SeedEdible Uses: OilCarbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. A minor or regional perennial crop in production with low or unreported yields [1-1]. Perennial hybrids are now under development. Wild perennial species found in Turkey , for example, *Secale monatum* Guss var. *anatolicum* Boiss and *Secale montanum* Guss var. *vavilovi* Grossh. have a larger stature, high frost resistance, strong tillering ability, and tolerance to poor soils and drought. Understanding wild plant species is becoming important in the development of new hybrid crops.

tcanta OilMany including Biomass; Green manure; Oil; Soil stabilization; and Thatching.

dwatta Possible. For example *Secale cereale* seed is made into a poultice and applied to tumours[218]. The seed is also an effective laxative due to its fibrous seed coat[269]. propta Seed. Division.

nwatta Management: Standard Staple Crop: Balanced carb Under DevelopmentClimate: boreal to warm temperate, Mediterranean. Humidity: semi-arid to humid. Carbon Farming Solutions - Cultivation: under development perennial hybrids. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 4.2.13 Secale strictum

Mountain Rye

3 tlin 7 cyuc 5 kcak 0 tcan 0 dwat 1.2 m hkuc htut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Secale strictum* is a PERENNIAL growing to 1.2 m (4ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: SeedEdible Uses: Seed - used as a whole grain or ground into a flour and used for making bread etc[46, 177, 183]. Somewhat smaller than the seed of *S. cereale* but produced abundantly. It is relatively difficult to extract the seed from the glumes by hand[K].

tcanta None known

dwatta None known

propta Seed - sow March or October in situ and only just cover the seed. Germination should take place within 2 weeks. If the seed is in short supply, it can be grown up in the greenhouse or cold frame in early spring. Only just cover the seed. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils but prefers a well-drained light soil in a sunny position[1]. One report says that it requires protection from severe frosts[1], though our experience is that it is hardy in most parts of the country[K]. Mountain rye is occasionally cultivated for its edible seed[61], it is possibly a parent of the cultivated Rye, *S. cereale*[57]. This species has an excellent potential as a perennial cereal crop in temperate zones. Although the seed is somewhat smaller than the cultivated annual rye, it is produced abundantly, especially from the second year onwards. The plant tillers well, especially in its second and subsequent years, and the ears in selected varieties can be 25cm long[K]. Not all forms of this species are perennial, the subspecies *S. strictum* kuprijanovii. Gross. is reliably so[46].

## 4.2.14 Foeniculum vulgare

Fennel, Sweet fennel

3 tlin 10 cyuc 5 kcak 4 tcan 3 dwat 1.5 m hkuc htut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta *Foeniculum vulgare* is an evergreen Perennial growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: Flowers Leaves Oil Root Seed S Uses: Condiment Drink Oil TeaLeaves - raw or cooked[2, 4, 5, 9, 27]. A delicious aniseed flavour[183], the young leaves are best since older ones soon become tough[K]. They are often used as a garnish on raw or cooked dishes and make a very pleasant addition to salads[183]. They help to improve digestion and so are particularly useful with oily foods[244]. The leaves are difficult to store dried[200], though this does not really matter since they can often be harvested all year round, especially if the plants are in a warm, sheltered position[K]. Leaf stalks and flower heads - raw or cooked[14, 37, 52, 183]. A similar aniseed flavour to the leaves[K]. The aromatic seeds are used as a flavouring in cakes, bread, stuffings etc[2, 4, 5, 21, 27, 183]. They have a similar flavour to the leaves[K] and also improve the digestion[244]. The sprouted seeds can be added to salads[183]. An essential oil from the fully ripened and dried seed is used as a food flavouring in similar ways to the whole seed[1, 46, 183, 245].

Root - cooked[53]. Somewhat parsnip-like. The leaves or the seeds can be used to make a pleasant-tasting herbal tea[16, 183].

**tcanta Dye Essential Oil Repellent Strewing**The seed yields up to 5% of an essential oil[1, 4, 46]. This is used medicinally, as a food flavouring, in toothpastes, soaps, perfumery, air fresheners etc[1, 46, 238]. The flavour of fennel oil depends upon its two main constituents. 'Fenchone' is a bitter tasting element whilst 'anethole' has a sweet anise-like flavour[238]. The proportions of these two ingredients varies according to strain and region. Plants growing in the Mediterranean and southern Europe usually have a sweet oil whilst plants growing in central and northern Europe usually produce a more bitter oil[238]. The quality of the oil also depends upon how well the seed has been dried - the oil from fully ripened and dried seeds being much sweeter and more fragrant[245]. The dried plant is an insect repellent[14, 53], the crushed leaves are effective for keeping dogs free of fleas[201]. The plant was formerly used as a strewing herb[201]. Yellow and brown dyes are obtained from the flowers and leaves combined[168].

**dwatta Analgesic Antiinflammatory Antispasmodic Aromatherapy Aromatic Carminative Diuretic Emmenagogue Expectorant Galactogogue Hallucinogenic Stimulant Stomachic Urinary**Fennel has a long history of herbal use and is a commonly used household remedy, being useful in the treatment of a variety of complaints, especially those of the digestive system[244]. The seeds, leaves and roots can be used, but the seeds are most active medicinally and are the part normally used[4]. An essential oil is often extracted from the fully ripened and dried seed for medicinal use, though it should not be given to pregnant women[4, 238]. The plant is analgesic, anti-inflammatory, antispasmodic, aromatic, carminative, diuretic, emmenagogue, expectorant, galactogogue, hallucinogenic, laxative, stimulant and stomachic[4, 7, 9, 21, 147, 165, 176, 192, 238]. An infusion is used in the treatment of indigestion, abdominal distension, stomach pains etc[254]. It helps in the treatment of kidney stones and, when combined with a urinary disinfectant like *Arctostaphylos uva-ursi*, makes an effective treatment for cystitis[254]. It can also be used as a gargle for sore throats and as an eyewash for sore eyes and conjunctivitis[254]. Fennel is often added to purgatives in order to allay their tendency to cause gripe, and also to improve the flavour[4]. An infusion of the seeds is a safe and effective cure for wind in babies[244]. An infusion of the root is used to treat urinary disorders[236]. An essential oil obtained from the seed is used in aromatherapy. Its keyword is 'Normalising'[210]. The essential oil is bactericidal, carminative and stimulant[218]. Some caution is advised, see notes above on toxicity[222]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Foeniculum vulgare* for cough, bronchitis, dyspeptic complaints (see [302] for critics of commission E).

**propta Seed** - best sown in early spring in situ[1]. The seed can also be sown in situ in the autumn[4, 37]. In many gardens it self sows freely. Division in March as the new growth appears[16, 200]. The plants are very tolerant of disturbance, we have found divisions to take well at any time of the year, though these divisions are never as good as seed-sown plants[K].

**nwatta** An easily grown plant, it succeeds in most soils but prefers a sunny dry position[4, 16, 37, 200]. It grows well in sandy soils[188] and is drought tolerant once established[190]. Plants often self-sow freely in the garden[K]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Although hardy in most parts of Britain, plants are liable to die out over the winter if the soil is not well-drained or the weather is persistently cold and wet[238]. Fennel is often cultivated in the herb garden for its edible and medicinal uses, there are some named varieties[183]. Especially in mild winters, the leaves can be available all year round[K]. It is best to cut a few plants back to ground level occasionally during the growing season, thus ensuring a constant supply of fresh young shoots[4]. In a dry summer make sure that you water the cut-down clump or it might not regrow that year[K]. Fennel is also grown commercially as a medicinal plant and for its essential oil[4, 238]. Fennel is in general a poor companion plant in the garden. It inhibits the growth of nearby plants, especially beans, tomatoes and kohlrabi[14, 18]. It is itself inhibited by wormwood and coriander[14, 18]. However, the flowering plant attracts

beneficial insects such as bees, parasitic wasps, tachinid flies and hoverflies to the garden. The presence of these creatures will help to maintain a natural balance of insects in the garden and help prevent infestations by aphids etc[238]. It is best not to grow fennel and dill (*Anethum graveolens*) close to each other since hybridisation can occur and the resulting seedlings will be of indeterminate flavour[238]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 4.2.15 Malva moschata

Musk Mallow

3 tlin 10 cyuc 5 kcaak 2 tcan 2 dwat 2 m hkuc  
hmimhmt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis  
hpa7tmwatli fyfxre7t hjonli

**drutta Malva moschata** is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Flowers Leaves SeedEdible Uses: Leaves - raw or cooked[K]. A mild pleasant flavour[K]. The leaves are mucilaginous and fairly bland, we use them in bulk in summer salads[K]. They make a very good perennial substitute for lettuce in a salad, producing fresh leaves from spring until the middle of summer, or until the autumn from spring germinating plants[K]. Flowers - raw[K]. A very decorative addition to the salad bowl, they have a very mild flavour[K]. Seed - raw. Best used before it is fully mature, the seed has a pleasant nutty taste but it is rather small and fiddly to harvest[K].

**tcanta Dye Fibre**Cream, yellow and green dyes can be obtained from the plant and the seed heads[168]. A fibre obtained from the stems is used for cordage, textiles and paper making[115].

**dwatta Antiphlogistic Astringent Demulcent Diuretic Emollient Expectorant Laxative Poulitice Salve Urinary**All parts of the plant are antiphlogistic, astringent, demulcent, diuretic, emollient, expectorant, laxative, salve[4, 7, 9, 21, 46, 222, 238]. The leaves and flowers can be eaten as part of the diet, or a tea can be made from the leaves, flowers or roots[222]. The leaves and flowers are the main part used, their demulcent properties making them valuable as a poultice for bruise, inflammations, insect bites etc, or taken internally in the treatment of respiratory system diseases or inflammation of the digestive or urinary systems[4, 238]. They have similar properties, but are considered to be inferior to the common mallow (*M. sylvestris*) and the marsh mallow (*Althaea officinalis*) and are seldom used internally[4]. The plant is an excellent laxative for young children[7].

**propta Seed** - best sown in early spring in a cold frame. The seed germinates quickly and easily. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in their permanent positions in the early summer[K]. If you have sufficient seed then it can be sown outdoors in situ in the middle to late spring. Basal cuttings in late spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are

## 4.2.96 Epilobium angustifolium

Willow Herb

3 tlin 7 cyuc 3 kcaak 2 tcan 2 dwat 2 m hkuc  
hmimhmt cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

**drutta Epilobium angustifolium** is a PERENNIAL growing to 2 m (6ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Leaves Root StemEdible Uses: TeaLeaves and young shoot tips - raw or cooked[2, 5, 12, 62, 172, 183]. They can be used in salads or cooked as a vegetable[9]. When boiled they make a wholesome vegetable and are a good source of vitamins A and C[2, 257]. Only use the leaves when they are young[85]. Although they are said to be edible, another report says that an infusion of them can stupefy[4]. Young shoots - cooked. They make a good asparagus substitute[2, 9, 183, 213]. Root - raw, cooked or dried and ground into a powder[74, 172]. Used in spring, it has a sweet taste[12, 74]. Flower stalks - raw or cooked[85, 106, 172, 183]. Added to salads, they are used when the flowers are in bud[183]. The pith of young or older stems - raw or cooked[62, 99, 183]. Slightly sweet, tender and pleasing to eat, though there is not much of it[85, 172]. Gelatinous[161], it can be used as a flavouring in soups[183]. The stems are said to be a good laxative, but are best not eaten on an empty stomach[256]. A tea is made from the dried leaves[9, 62, 85, 94, 183], it is sweet and pleasant[172]. Called 'kaporie' tea in Russia, it contains 10% tannin[222]. The leaves are also used as an adulterant of China tea[2].

**tcanta Fibre Stuffing Tinder Weather protection**A fibre obtained from the outer stems is used to make cordage[99, 207, 256]. The 'cottony' seed hairs are used as a stuffing material[99, 118] or as a tinder[106, 172]. The powdered inner cortex is applied to the hands and face to give protection from the cold[99, 172, 257].

**dwatta Antiinflammatory Antispasmodic Astringent Demulcent Dysentery Emollient Hypnotic Laxative Poulitice Tonic**Willow herb is often used as a domestic herbal remedy, though it is little used in conventional herbalism. The herb is antispasmodic, astringent, demulcent, emollient, hypnotic, laxative and tonic[4, 7, 172, 192]. It is used in the treatment of diarrhoea, mucous colitis and irritable bowel syndrome[254]. The plant is used in Germany and Austria to treat prostate problems[254]. A poultice of the leaves is applied to mouth ulcers[222]. An extract of the leaves has anti-inflammatory activity[222]. An ointment made from the leaves has been used to soothe skin problems in children[254]. A tea made from the leaves and roots is a folk remedy for dysentery and abdominal cramps[222]. A poultice made from the peeled roots is applied to burns, skin sores, swellings, boils etc[222, 257].

**propta Seed** - sow early spring in situ or as soon as the seed is ripe[111]. This plant is more than capable of finding its own way into most gardens and does not usually require an invitation. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** An easily grown plant, it prefers a well-drained but moisture retentive soil in a sunny position[200], though it succeeds in most soils[1]. It prefers a moist soil[111], but also succeeds on dry banks[188]. It is best grown in open woodland[1]. Plants are hardy to at least -20°C[187]. The rosebay willowherb spreads vigorously by means of a creeping rhizome, and often forms large patches[187]. It is apt to become a weed especially through its seed which is very light and capable of travelling long distances in the wind. It is often one of the first plants to colonize disturbed areas such as scenes of fires[1, 200]. A very ornamental plant[1], it is the floral emblem of the Yukon[172]. A food plant for the caterpillars of several lepidoptera species[24], it is also a good bee plant[74, 94]. The plant is heat tolerant in zones

7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.97 Vaccinium ovatum

Evergreen Huckleberry, Florist's Huckleberry, Shot Huckleberry, Californian Huckleberry  
3 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 2.5 m hkuc  
hmimhmt cyutli kyuctup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

**drutta Vaccinium ovatum** is an evergreen Shrub growing to 2.5 m (8ft 2in) at a slow rate. It is frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** FruitEdible Uses: TeaFruit - raw, cooked or dried for later use[3, 101, 105, 118, 183, 257]. Somewhat sweet but slightly dry[183, 256]. The fruit is quite palatable but is nothing special[K]. A strong flavour, they are usually cooked in pies, preserves etc[177, 183]. The fruit will often hang on the bush until early winter[256]. The fruit is about 6mm in diameter[200]. A tea is made from the leaves and dried fruit[101].

**tcanta None known**

**dwatta Antiseptic Astringent Birthing aid Carminative Hypoglycaemic**The leaves are antiseptic, astringent, carminative and hypoglycaemic[172]. An infusion of the leaves and sugar have been given to a mother after childbirth to help her regain her strength[257]. A decoction of the leaves has been used in the treatment of diabetes[257].

**propta Seed** - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

**nwatta** Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Most species require shelter from strong winds[200], but judging by the native range of this species it might succeed in maritime exposure[K]. Hardy to about -15°C[184]. Plants are sometimes cut back by late frosts[11] A very ornamental plant[60], it is sometimes cultivated for its edible fruit, there are some named varieties[183]. One report says that it does not fruit freely in Britain[11], but a shrub growing in the shade of oak trees at the RHS gardens in Wisley was seen to be heavy with fruit in the autumns of 1987 and 1988[K]. A shade loving plant, growing well in a woodland[182]. Plants in this genus are notably resistant to honey fungus[200]. Dislikes



by some botanists[1, 17]. The leaves, when bruised, have a delicious fragrance[245]. The flowers are also fragrant. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with box-wood[18]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.94 Berberis georgii

Barberry

3 tin 7 cyuc 3 kcaak 1 tcan 2 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfriphpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis georgii is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

ckaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. A very acid lemon-like flavour, it is nice in small quantities raw. When cooked it can be used in pies, preserves etc[K]. A very good size for a barberry, the fruit is up to 10mm long and 4mm wide[K]. A refreshing lemon-like drink can be made from the fruit.

tcanta DyeA yellow dye is obtained from the roots, bark and stem.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Suckers, removed in late autumn/early winter and planted out in situ or potted up and planted out in late spring[200].

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. Plants are hardy to about -35°C. This species is a hybrid of unknown origin, probably involving *B. vulgaris*[11]. It is an exceptionally free-fruiting form[184] and is of interest in breeding programmes[K]. This species is probably an alternate host of black-stem rust of wheat. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they resprout well from the base[200].

## 4.2.95 x Sorbaronia hybrid

Aronia x mountain ash

3 tin 8 cyuc 3 kcaak 2 tcan 0 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli prik hpa7tmwatli hjonli

drutta x Sorbaronia hybrid is a deciduous Tree growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4. The flowers are pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Fruit. Fruit - cooked. A good flavour but very astringent[183]. The fruit should be fully ripe before being eaten and is best after a frost or two. It makes a good jelly when sugar is added and is also dried and used for making pemmican[183]. The fruit is rich in pectin and can be added to fruits that are low in this substance when making jams etc[183]. Pectin is also said to protect the body against radiation[201]. The fruit is upto 12mm in diameter depending on the hybrid.

tcanta The fruit is a source of pectin[183], a substance that is used to thicken jams etc and as a culture medium in laboratories.

dwatta None known

propta Seed - best sown as soon as it is ripe in pots outdoors or in a cold frame[113]. Pre-soak stored seed overnight and then cold stratify for 3 months at 2°C[113]. The seed germinates in 1 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring. Cuttings of half-ripe wood, July/August in a frame[113]. Division of suckers in the dormant season[200]. Very easy, they can be planted straight out into their permanent positions. Layering[200].

nwatta A group of some half a dozen hybrids between Aronia and Sorbus - all shrubs or small trees. Where the whitebeam is the Sorbus parent the leaves are simple (x *S. alpina* and x *S. dippeii*). The other cultivated hybrids have Sorbus aucuparia or *S. americana* as the other parent, and the leaves are partly pinnate. Species include x *Sorbaronia alpina* A deciduous shrub with red fruits, x *Sorbaronia dippeii* a bushy-headed shrub with fruits top-shaped or roundish, 9mm 1/3 in. long, blue-black in color, x *Sorbaronia hybrida* a laxly branched shrub or small tree with dark purple fruit, globular or broad-ellipsoid, about 12mm 3/8 in. wide. (treesandshrubsonline.org/articles/x-sorbaronia/). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. Landscape Uses: Screen, Specimen. Prefers a moist peaty soil in full sun or partial shade[200]. Succeeds in most soils but dislikes shallow chalk[200]. Plants are hardy to about -25°C. Special Features: Attracts birds, Naturalizing, Wetlands plant, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2]. The cultivar Ivan's Beauty is a small spreading tree 2.5m 8ft tall with small, dark purple fruit, about 12mm 1/2inch in diameter with an intense tart-sweet flavour. Excellent for jams, wine, jelly or sauces. Very high in vitamin C. Can be stored under refrigeration until spring. It has striking, large glossy dark-green leaves and large clusters of pinkish flowers. Ideal for edible landscaping.

rooting well. Plant them out in the summer. Cuttings of side shoots, July/August in a cold frame[111].

nwatta Landscape Uses:Border A very easily grown plant, succeeding in ordinary garden soil[1], though it prefers a reasonably well-drained and moderately fertile soil in a sunny position[200]. Hardy to about -25°C[187]. A very ornamental plant[1]. It is very variable in form, especially with regard to the degree of laciniation of the leaves[17]. The crushed leaves have a musk-like smell[245]. Plants are generally quite short-lived though they can self-sow freely when in a suitable position and usually more than maintain themselves[233, K]. If the plant is pruned back to the main branches as it comes into flower, then it will produce a fresh flush of leaves in late summer for salad use[K]. A good plant for the summer meadow[24]. Plants seem to be immune to the predations of rabbits[233]. Prone to infestation by rust fungus[200]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, Naturalizing. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2].

## 4.2.16 Rumex acetosa

Sorrel, Garden sorrel

3 tin 7 cyuc 5 kcaak 4 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Rumex acetosa is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen from June to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Curdling agentLeaves - raw or cooked[2, 4, 5, 7, 13, 27]. They make a thirst-quenching on their own, or can be added to salads, used as a potherb or pureed and used in soups[183]. A delicious lemon-like flavour, liked by most people who try them, they can be rather overpowering in quantity and are more generally used as a flavouring in mixed salads[K]. The leaves can also be dried for later use[12]. The leaves can be available all through the winter, especially in mild weather or if a little protection is given to the plants[K]. The leaves should be used sparingly in the diet[9, 21], see the notes on toxicity above. Flowers - cooked as a vegetable or used as a garnish[183]. Root - cooked. It is dried, ground into a powder and made into noodles[105]. Seed - raw or cooked[172]. Ground into a powder and mixed with other flours to make bread[183]. The seed is easy to harvest, but is rather small and fiddly to use[K]. The juice of the leaves can be used as a curdling agent for milks[4, 183].

tcanta Cleanser Dye PolishDark green to brown and dark grey dyes can be obtained from the roots, they do not need a mordant[168]. A grey-blue dye is obtained from the leaves and stems[106]. An infusion of the stems is used as a polish for bamboo and wicker furniture and also for silver[53, 238]. The juice of the plant removes stains from linen[14] and also ink stains (but not ball-point ink) from white material[53, 238]. It is sometimes sold as 'essential salt of lemon'[4]. A dynamic accumulator gathering minerals or nutrients from

the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anthelmintic Antiscorbatic Astringent Depurative Diuretic Febrifuge Homeopathy Laxative Refrigerant StomachicThe fresh or dried leaves are astringent, diuretic, laxative and refrigerant[4, 7, 14, 21, 238]. They are used to make a cooling drink in the treatment of fevers and are especially useful in the treatment of scurvy[4]. The leaf juice, mixed with fumitory, has been used as a cure for itchy skin and ringworm[4]. An infusion of the root is astringent, diuretic and haemostatic[4, 7, 14, 21, 218]. It has been used in the treatment of jaundice, gravel and kidney stones[4]. Both the roots and the seeds have been used to stem haemorrhages[4]. A paste of the root is applied to set dislocated bones[272]. The plant is depurative and stomachic[7, 14, 21, 218]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of spasms and skin ailments[9].

propta Seed - sow spring in situ. Leaves can be harvested within 8 weeks from sowing. Division in spring. Division is very simple at almost any time of the year, though the plants establish more rapidly in the spring. Use a sharp spade or knife to divide the rootstock, ensuring that there is at least one growth bud on each section of root. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Industrial Crop: Biomass Management: Hay Management: Standard Minor Global Crop Staple Crop: Balanced carbA very easily grown and tolerant plant, it succeeds in most soils[37], preferring a moist moderately fertile well-drained soil in a sunny position[200]. Shade tolerant[12]. Established plants are tolerant of considerable neglect, surviving even in dense weed growth[K]. Sorrel has been used since ancient times as a food and medicinal plant[244]. It is still occasionally cultivated for its edible leaves, there are some named varieties[183]. The plant stops producing leaves when it flowers in the summer, regrowing after the seed has set. Plants also usually die down in the winter. Cutting down the flowering stem will encourage the growth of fresh young leaves[4]. 'Blonde de Lyon' has large, only slightly acid leaves and is much less likely to flower than the type[200]. This means that the leaves of this cultivar are often available all through the summer and are often also produced throughout the winter, especially if the winter is mild[200, K]. A food plant for the caterpillars of many species of butterfly, it is a good plant to grow in the spring meadow[24]. Dioecious. Male and female plants must be grown if seed is required. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 4.2.17 Camassia quamash

Quamash, Small camas, Utah small camas, Walpole's small camas

3 tin 7 cyuc 5 kcaak 3 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfriphpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Camassia quamash is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[62, 95]. The bulb, which can be up to 5cm in diameter[270], has a mild, starchy flavour when eaten raw, but a gummy texture that reduces the enjoyment of it somewhat[K]. When cooked, however, it develops a delicious sweet flavour somewhat like sweet chestnuts[92], and is a highly nutritious food[2]. Excellent when slow baked, it can also be dried and made into a powder which can be used as a thickener in stews or mixed with cereal flours when making bread, cakes etc[K]. The bulbs can be boiled down to make a molasses, this was used on festival occasions by various Indian tribes[2, 183]. The bulbs can be harvested at any time of the year[85], but are probably best in early summer when the seeds are ripe[94]. One report says that the bulbs contain inulin (a starch that cannot be digested by humans) but that this breaks down when the bulb is cooked slowly to form the sugar fructose which is sweet and easily digested[256]. Quamash bulbs were a staple food of the N. American Indians[42, 92]. The tribes would move to the Quamash fields in the early autumn and, whilst some people harvested the bulbs, others would dig a pit, line it with boulders then fill it with wood and set fire to it. The fire would heat the boulders and the harvested bulbs would then be placed in the pit and the whole thing covered with earth and the bulbs left to cook slowly for 2 days. The pit would then be opened and the Indians would feast on the bulbs until they could no longer fit any more in their stomachs. Whatever was left would be dried and stored for winter use.

tcanta Notable Products: Nectar, pollen, edible bulb. Attracts Wildlife - flowers attract beneficial insects. Grown as an ornamental plant.

dwatta Birthing aid OxytoxicA decoction of the roots has been used to induce labour[257]. An infusion of the leaves has been used to treat vaginal bleeding after birth and to help expel the placenta[257].

propta Seed - best sown as soon as it is ripe in a cold frame[134]. The seed can also be sown in a cold frame in spring[134]. It usually germinates in 1 - 6 months at 15°C, but it can be erratic[138]. Sow the seed thinly so that it does not need to be thinned and allow the seedlings to grow on undisturbed for their first year. Give an occasional liquid feed to ensure that the plants do not become nutrient deficient. When the plants are dormant in late summer, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on for another one or two years in a cold frame before planting them out when dormant in late summer. Offsets in late summer. The bulb has to be scored in order to produce offsets.

nwatta Succeeds in almost any soil[42]. Grows well in heavy clay soils. Prefers a rather heavy loam[1] that has plenty of moisture in spring but does not remain wet over the winter[138, 200]. Dislikes dry soils[200]. Prefers full sun but tolerates partial shade[138, 200]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°C[214]. Quamash is a very pretty flowering bulb that has quite a large potential as an edible ornamental plant[K]. It grows very well in the flower border but can also be naturalised in damp grass[134]. We are intending to grow it in a grassed-down orchard in our Cornish trial ground. The bulbs flower in late spring and early summer and have completely died down by early July so they do not interfere with harvesting the apple crop. The grass in the orchard will be cut in early spring before the quamash comes into growth, but will not be cut again until July. The bulbs will be harvested at any time from July to December and, since it is impossible to find all the bulbs, it is hoped that those remaining will be able to increase and supply bulbs for future years[K]. A polymorphic and very ornamental plant[1], there are some named varieties[200]. The subspecies C. quamash maxima has larger bulbs than the type, up to 65mm in diameter[270]. A good bee plant[108]. This species can be confused with certain poisonous bulbs in the genus *Zigadenus*[85]. Plant the bulbs 7 - 10cm deep in early autumn and then leave undisturbed[1]. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin

to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is a bulb.

## 4.2.18 Prunus avium

Wild Cherry, Sweet cherry  
3 tlin 7 cyuc 4 kcaak 4 tcan 2 dwat 18 m hkuc  
hmimhtut cyutili tcup hwicli hrasjlutnyik hpa7tli flatprikkwis  
hpa7tmwatli dyatxre7t hjonli

drutta Prunus avium is a deciduous Tree growing to 18 m (59ft) by 7 m (23ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: GumFruit - raw or cooked[2, 12, 13]. It can be sweet or bitter but it is not acid[11]. The fruit can be cooked in pies etc or used to make preserves. The fruit contains about 78% water, 8.5 - 14% sugars[74]. The fruit is about 20mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible gum is obtained by wounding the bark[115, 183].

tcanta Dye Gum Tannin WoodAgroforestry Uses: Wild cherry is essentially a pioneer species, and quickly colonises clearings by seeds and suckering, forming secondary woodland, but is often out-competed later by other hardwood species. It is used extensively in Europe for the afforestation of agricultural land and it is also valued for wildlife and amenity plantings[1195 ]. The flowers are a good source of pollen and nectar for bees[74 , 1145 ]. This species is a bad companion for potatoes, making them more susceptible to potato blight[201 ], it also suppresses the growth of wheat[18 ]. It also grows badly with plum trees, its roots giving out an antagonistic secretion[201 ]. Other Uses: A green dye can be obtained from the leaves[168 ]. A dark grey to green dye can be obtained from the fruit[168 ]. The bark, especially of the root, contains the dye phlorizin[74 ]. The wood contains the dye xylan[74 ]. The seed contains around 30% oil[74 ]. The bark usually only contains small amounts of tannin, but this sometimes rises to 16%[223 ]. This species has been utilized to breed cherry cultivars with resistance to frost and a number of diseases. Among cultivated forms there are very ornamental ones with double and pink flowers, motley or dissected leaves as well as with a drooping crown[1145 ] The heartwood is pinkish-brown; the sapwood red. The grain is fine and straight, with a satiny texture. The wood is firm, compact, and generally free from defects. A valuable, attractive timber that is easy to work, it is used for turnery, furniture, cabinet making, panelling, musical instruments etc[46 , 74 , 100 , 115 , 1195 ]. The red sapwood is valued in turnery and woodwork[74 ].

dwatta Antitussive Astringent Diuretic TonicThe fruit stalks are astringent, diuretic and tonic[4, 7, 238]. A decoction is used in the treatment of cystitis, oedema, bronchial complaints, looseness of the bowels and anaemia[4, 238]. An aromatic resin can be obtained by making small incisions in the trunk[7]. This has been used as an inhalant in the treatment of persistent coughs[7]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200].

named varieties[11, 200]. 'Dulcis' the fruit of which is sweet or slightly sour[200]. 'Asperma' is a seedless form that was often used in France to make a jam[182, 183]. An alternate host of 'black-stem rust' of wheat so it has been extensively grubbed up from its habitats[3, 11, 13, 74]. Hybridizes freely with other members of this genus[1], though it usually breeds fairly true to type[80]. Can be pruned back quite severely, it resprouts well from the base[200].

## 4.2.92 Vaccinium ovalifolium

Black Huckleberry, Oval-leaf blueberry  
3 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 3 m hkuc  
hmimhtut cyutili tcup hwicli hrasjlut hpa7tli frusflat  
hpa7tmwatli xre7t hjonli

drutta Vaccinium ovalifolium is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 118, 161, 172, 257]. Mildly acidic[11, 200]. A pleasant sweet flavour[212]. The fruit is a reasonable source of vitamin C[257]. The fruit can also be dried for later use[183] when they have a flavour like raisins[256]. The fruit is about 10mm in diameter[200].

tcanta None known  
dwatta Antiseptic Astringent Birthing aid Carminative Hypoglycaemic Vitamin CAntiseptic, astringent, carminative, hypoglycaemic[172]. An infusion of the leaves and sugar have been given to a mother after childbirth[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. The fruit is borne singly rather than in clusters[183]. This species is closely related to *V. parvifolium*[182]. Plants in this genus are notably resistant to honey fungus[200].

## 4.2.93 Rosa canina

Dog Rose  
3 tlin 7 cyuc 3 kcaak 4 tcan 3 dwat 3 m hkuc  
hmimhtut cyutili tucpha7n hwicli hrasjlutnyikfrp hpa7tli flatprikkwis hpa7tmwatli fyfxre7t hjonli

drutta Rosa canina is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies), Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic

(mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Fruit SeedEdible Uses: Coffee TeaFruit - raw or cooked[2, 4, 13]. It can be used in making delicious jams, syrups etc[7]. The syrup is used as a nutritional supplement, especially for babies[238]. The fruit can also be dried and used as a tea[9, 12, 183]. Frost softens and sweetens the flesh[12]. The fruit is up to 30mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The seed is a good source of vitamin E[102], it can be ground and mixed with flour or added to other foods as a supplement. Be sure to remove the seed hairs[102]. The dried leaves are used as a tea substitute[46, 61, 183]. A coffee substitute according to another report[7]. Petals - raw or cooked[177]. The base of the petal may be bitter so is best removed[183]. Eaten as a vegetable in China[66]. The petals are also used to make an unusual scented jam[7].

tcanta Hedge HedgePlants make a dense and stock-proof hedge, especially when trimmed[186].

dwatta Antirheumatic Astringent Bach Cancer Carminative Diuretic Laxative Ophthalmic Tonic Vermifuge Vitamin CThe petals, hips and galls are astringent, carminative, diuretic, laxative, ophthalmic and tonic[7, 9, 14, 21, 165]. The hips are taken internally in the treatment of colds, influenza, minor infectious diseases, scurvy, diarrhoea and gastritis[238]. A syrup made from the hips is used as a pleasant flavouring in medicines and is added to cough mixtures[238]. A distilled water made from the plant is slightly astringent and is used as a lotion for delicate skins[7]. The seeds have been used as a vermifuge[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Resignation' and 'Apathy'[209]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214]. Ascorbic acid in Dog Rose shells (vitamin C, 0.2 to 2.4%).

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeeds in most soils[11, 200]. Grows well in heavy clay soils. Prefers a circumneutral soil and a sunny position with its roots in the shade[11, 200]. When grown in deep shade it usually fails to flower and fruit[186]. Succeeds in wet soils but dislikes water-logged soils or very dry sites[186]. Tolerates maritime exposure[186]. The fruit attracts many species of birds, several gall wasps and other insects use the plant as a host[186]. A very polymorphic species, it is divided into a great number of closely related species

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 62, 65]. Sweet and palatable, tasting somewhat like raisins or dates[101, 105, 183]. The fruits have a large seed and a thin flesh[183]. The taste is best after a frost[62, 65]. The ovoid fruit is about 15mm long and contains a single large seed[200].

tcanta None known

dwatta Analgesic Blood purifier InfertilityThe leaves are analgesic[257]. They have been mashed and applied to the head as a poultice to ease a migraine[257]. A decoction of the roots has been used as a blood medicine[257]. The decoction has been used as a fertility aid by women[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in a shady position[11]. Requires a moist acid soil and woodland conditions but without competition from other plants[11, 184, 200]. Another report says that it requires an exposed position[3]. Dislikes alkaline soils[184]. Best if given shade from the early morning sun in spring[200]. A very hardy plant, tolerating temperatures down to about -30°c[184]. Plants are self-compatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Plants are often self-layering in the wild and form thickets[184]. This species is closely related to *V. furcatum*[184].

### 4.2.91 *Berberis vulgaris*

European Barberry, Common barberry
3 tlin 7 cyuc 3 kcaak 4 tcan 3 dwat 3 m hkc
hmimhtut cyutli kyuctup hwicli yishrhajslutnyikfrip hpa7tli flatprikwlis hpa7tmwatli fyifkre7t hjonli

drutta *Berberis vulgaris* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf from March to November, in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Condiment TeaFruit - raw or cooked[2, 3, 5, 7, 9, 11, 95, 183]. Rich in vitamin C[268], the fruit has a very acid flavour and is mainly used in preserves[100], though children and some adults seem to like it raw when it is fully ripe[K]. A refreshing lemon-like drink can be made from the fruit[183]. The fruits are about 10mm long[200]. Young leaves - used as a flavouring or as an acid nibble[177, 183]. They can be used in much the same way as sorrel (*Rumex acetosa*) [9]. The dried young leaves and shoot tips make a refreshing tea[9, 183].

tcanta Beads Dye Fuel Hedge Hedge WoodPlants can be grown as a medium-size hedge in exposed positions but they cannot tolerate extreme maritime exposure[75]. They are very tolerant of trimming but can also be left untrimmed if required[K]. A good quality yellow dye is obtained from the roots, bark and stem[4, 13, 46, 100, 244]. As well as being used on cloth, it is also used to stain wood[244]. The unripe fruit is dried and used as beads[106]. Wood - soft, very hard, fine grained, yellow. Used for carving, toothpicks, mosaics etc[13, 46, 61]. It is also used as a fuel[146].

dwatta Antibacterial Antidiarrhoeal Antipruritic Antirheumatic Antiseptic Antispasmodic Appetizer Astringent Cancer Chologogue Diaphoretic Diuretic Dysentery Expectorant Hepatic Homeopathy Laxative Malaria Ophthalmic Purgative Refrigerant Stomachic TB Tonic Vitamin CBarberries have long been used as a herbal remedy for the treatment of a variety of complaints. All parts of the plant can be used though the yellow root bark is the most concentrated source of active ingredients. The plant is mainly used nowadays as a tonic to the gallbladder to improve the flow of bile and ameliorate conditions such as gallbladder pain, gallstones and jaundice[254]. The bark and root bark are antiseptic, astringent, cholagogue, hepatic, purgative, refrigerant, stomachic and tonic[4, 7, 9, 21, 46, 165, 222]. The bark is harvested in the summer and can be dried for storing[4]. It is especially useful in cases of jaundice, general debility and biliousness[4], but should be used with caution[165]. The flowers and the stem bark are antirheumatic[218]. The roots are astringent and antiseptic[222]. They have been pulverized in a little water and used to treat mouth ulcers[213]. A tea of the roots and stems has been used to treat stomach ulcers[213]. The root bark has also been used as a purgative and treatment for diarrhoea[213] and is diaphoretic[222]. A tincture of the root bark has been used in the treatment of rheumatism, sciatica etc[222]. The root bark is a rich source of the alkaloid berberine -about 6%[240]. Berberine, universally present in rhizomes of *Berberis* species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (*Liquorice*) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218] and is also effective in the treatment of hypersensitive eyes, inflamed lids and conjunctivitis[244]. A tea made from the fruits is antipruritic, antiseptic, appetizer, astringent, diuretic, expectorant and laxative[7, 222]. It is also used as a febrifuge[213]. The fruit, or freshly pressed juice, is used in the treatment of liver and gall bladder problems, kidney stones, menstrual pains etc[9]. The leaves are astringent and antiscorbutic[7]. A tea made from the leaves is used in the treatment of coughs[222]. The plant (probably the inner bark) is used by homeopaths as a valuable remedy for kidney and liver insufficiency[244]. Other uses include malaria, and opium and morphine withdrawal[301].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Germination averages out at about 90%[98, 113]. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Suckers, removed in late autumn/early winter and planted out in situ or potted up and planted out in late spring[3, 200].

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Prefers a light rich rather dry soil according to another report[37]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200] but requires a moist soil when grown in the shade of trees[14]. Hardy to about -35°c[184]. A very ornamental plant[11], the barberry was at one time cultivated for its edible fruit, there are several

Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Division of suckers in the dormant season[98]. They can be planted out direct into their permanent positions. Layering in spring.

nwatta Landscape Uses:Espalier. Requires a well-drained moisture retentive soil[1, 11]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. A very ornamental plant[1], it is fast growing on deep moist soils[11] but is shallow rooting[98]. Trees cast a light shade and are themselves intolerant of heavy shade[186]. They produce quite a lot of suckers and can form thickets, especially if the main trunk is felled[186]. This species is a parent of many cultivated forms of sweet cherries[17, 34], especially the black fruited forms[11]. Where space is at a premium, or at the limits of their climatic range, sweet cherries can be grown against a wall. Most cultivars will grow well against a sunny south or west facing wall though east or north facing walls are not very suitable[219]. The main problems with growing this species against a wall are firstly that it is usually completely self-sterile and so there needs to be space for at least two different cultivars[186], secondly it is very vigorous and so is difficult to keep within bounds[219]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. An excellent tree for insects[24] and the fruit is a good food source for birds. A bad companion for potatoes, making them more susceptible to potato blight[201], it also suppresses the growth of wheat[18]. It also grows badly with plum trees, its roots giving out an antagonistic secretion[201]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Edible, Not North American native, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

### 4.2.19 *Prunus serotina*

Rum Cherry - Wild Cherry, Black Cherry, Wild Black Cherry
3 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 18 m hkc
htut cytuli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta *Prunus serotina* is a deciduous Tree growing to 18 m (59ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Condiment DrinkFruit - raw or cooked in pies, jellies, stews etc[2,

11, 34, 55, 62, 101, 149, 183]. It must be fully ripe or else it will have a bitter flavour. The fruit can taste sweet or bitter[43]. The better fruits have a thin skin and a juicy flesh with a pleasant vinous flavour[82]. The fruit can also be used as a flavouring[149]. The taste is best when the plant is grown in a sunny position[159]. The fruit is about 9mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An infusion of the twigs is used as a beverage[161, 257]. An extract from the bark is used commercially as a flavouring in soft drinks, sweets, syrups and baked goods[183].

tcanta Dye WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - close and straight-grained, light, strong, rather hard, highly shock resistant[46, 82, 149, 171, 229]. It bends well, works well, finishes smoothly, glues well, seasons well, shrinks moderately and is moderately free from checking and warping[227]. It weighs about 36lb per cubic foot and takes a beautiful polish[227]. It is widely used for furniture, cabinet making, the interior finish of buildings etc[46, 82, 149, 171, 229].

dwatta Antidiarrhoeal Antitussive Astringent Dysentery Pectoral Sedative Stomachic TonicRum cherry was widely employed medicinally by various native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. The bark of the root, trunk and branches is antitussive, astringent, pectoral, sedative, stomachic, tonic[4, 21, 95, 165, 238]. The medicinal properties of this plant are destroyed by boiling, so the plant should only be allowed to steep in warm water[213]. The root bark and the aromatic inner bark have expectorant and mild sedative properties and a tea made from either of them has been used to ease pain in the early stages of labour[213, 222]. The tea is also used in the treatment of fevers, colds, sore throats, diarrhoea etc[222, 257]. The bark is harvested in the autumn and should not be stored for longer than one year since it quickly loses its medicinal properties[4, 213]. Young thin bark is preferred[213]. A decoction of the inner bark has been used in the treatment of laryngitis[257]. The root bark has been used as a wash on old sores and ulcers[257]. The bark contains the glycoside prunasin, which is converted in the digestive tract to the highly toxic hydrocyanic acid[222]. Prunasin is at its highest level in the bark in the autumn[222] so the bark is harvested at this time and can be dried for later use[254]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238]. The fruit is astringent and has been used in the treatment of dysentery[213].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Requires a well-drained moisture retentive soil[1, 11]. Requires a warm sunny position[11, 159]. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. A fast-growing and moderately long-lived tree in the wild, producing a heavy fruit crop about once every 4 years[229]. It is cultivated for its timber in C. Europe[50]. This species produces an abundance of flowers and usually fruits well in Britain[11]. In the wild the tree begins to fruit when about 10 years old and then continues for about 100 years, fruiting well in most years[149]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Attracts birds, North American native, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Fragrant flowers, Attractive flowers or blooms.

## 4.2.20 Pinus cembra

Swiss Stone Pine, Swiss Pine, Arolla Pine  
3 tin 9 cyuc 4 kcaak 3 tcan 2 dwat 15 m hkuc  
hmimhtut cyutli hgatkuyctup hwicli hyishrasljutnykfrp  
hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus cembra is an evergreen Tree growing to 15 m (49ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from May to June, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: Condi- ment OilSeed - raw or cooked[1, 2, 4, 34, 177, 183]. Much valued as a food, the oil-rich seed has a delicious flavour but with a slight flavour of turpentine. A reasonable size, it is about 10mm x 8 mm[200]. An edible drying oil is obtained from the seed[2, 57, 63, 183]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide Oil Resin WoodLandscape Uses: Screen, Specimen, ornamental. A tan or green dye is obtained from the needles[168]. The needles contain a substance called terpen, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Turpentine is obtained from the leaves[46, 61]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - soft, easily worked. Used for furniture, turnery etc[46, 61, 100].

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Thrives in a light well-drained sandy or gravelly

loam[1]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Succeeds in most situations, flourishing on N. facing slopes and in moist heavy clay soils[81]. Grows best in the cooler wetter areas of Britain[11, 81]. A very hardy plant tolerating temperatures down to about -30°C[160]. The edible seeds are collected in large numbers in Siberia and are often exported[142]. (This report probably refers to the sub-species *P. cembra sibirica*.) This species does not appear to be long lived or to produce its cones freely in S. Britain[11]. It does not produce cones until it is 30 years old[200]. The cones take three years to ripen and then fall from the tree with the seeds still inside[120]. The seed is often eaten by squirrels etc before it can fall to the ground. The cones do not open, seed is extracted by breaking up the soft scales of the cone[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Slow growing in cultivation[81, 120], plants usually make less than 30 cm increase in height per year even when young[185]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen.

## 4.2.21 Actinidia kolomikta

Kiwi

3 tin 8 cyuc 4 kcaak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliws  
hpa7tmwatli nyanhjen hjonli

drutta Actinidia kolomikta is a deciduous Climber growing to 10 m (32ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw, cooked or dried for later use[1, 3, 105, 183]. Sweet and agreeable[1, 74]. It contains up to 5 times the vitamin C of blackcurrants[74]. The ovoid fruit is hairless and pale orange when fully ripe and is up to 25mm in diameter[266]. It contains a number of small seeds, but these are easily eaten with the fruit[K]. Young leaves - cooked[105, 177]. Used as a potherb or added to soups[183]. One report suggests the its Content of vitamin C in berries is 1520mg in 100grams of fruit.

tcanta None known

dwatta Vitamin CNone known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The

medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 5, 46]. The fruit is up to 8.5mm in diameter but with a large seed[200]. A sour taste, it is best cooked. The crushed fruit has an unpleasant smell[4]. Used as a cranberry substitute in making, jellies, preserves etc[183]. Some caution is advised, see notes on toxicity at top of the page.

tcanta Dye Hedge Hedge Ink WoodA red dye is obtained from the fruit[13]. An ink can be made from the dried berries[4]. Plants can be grown as a tall hedge[29], they are rather bare in winter though[K]. The wood can be used to make skewers[4].

dwatta Antispasmodic Astringent Birthing aid Homeopathy SedativeGuelder rose is a powerful antispasmodic and is much used in the treatment of asthma, cramps and other conditions such as colic or painful menstruation[254]. It is also used as a sedative remedy for nervous conditions[254]. The bark is antispasmodic, astringent and sedative[4, 9, 46, 165, 213]. The bark contains 'scooletin', a coumarin that has a sedative effect on the uterus[238]. A tea is used internally to relieve all types of spasms, including menstrual cramps, spasms after childbirth and threatened miscarriage[9, 222, 238]. It is also used in the treatment of nervous complaints and debility[4, 46, 165, 213]. The bark is harvested in the autumn before the leaves change colour, or in the spring before the leaf buds open. It is dried for later use[238]. The leaves and fruits are antiscorbutic, emetic and laxative[4, 222]. A homeopathic remedy is made from the fresh bark[9]. It is used in the treatment of menstrual pain and spasms after childbirth[9].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich moist loamy soil in a sunny position[11]. Succeeds in semi-shade but does not grow or fruit so well in such a position[186]. Grows well in heavy clay soils and on chalk[184]. Does not do well on very acid soils. Best if given shade from the early morning sun in spring[200]. A very ornamental plant[1], it is hardy to about -30°C[184] and is often grown in the flower garden. There are many named varieties[184]. Guelder rose regenerates quickly if it is cut to the ground, it can also produce suckers and will often form thickets[186]. The plant is an alternative host for the broad bean aphid[11]. Special Features: Not North American native, Naturalizing, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 4.2.89 Rubus allegheniensis

Alleghany Blackberry, Graves' blackberry  
3 tin 7 cyuc 3 kcaak 1 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliws  
hpa7tmwatli fyfixre7t hjonli

drutta Rubus allegheniensis is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit StemEdible Uses: Fruit - raw, cooked or dried for later use[34, 101, 161, 257]. A pleasant sweet and somewhat spicy flavour[3, 159, 171, 183]. The fruit is about 12mm in diameter[200] and can be 3cm long[235]. Young shoots - raw. They are harvested in the spring, peeled and used in salads[183].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta Antihæmorrhoidal Antirheumatic Astringent Diuretic Ophthalmic Stimulant TB Tonic UrinaryThe roots are antihæmorrhoidal, antirheumatic, astringent, stimulant and tonic[257]. An infusion can be used in the treatment of stomach complaints, diarrhoea, piles, coughs and colds, tuberculosis and rheumatism[257]. The infusion has also been used by women threatened with a miscarriage[257]. The root can be chewed to treat a coated tongue[257]. An infusion of the root has been used as a wash for sore eyes[257]. The leaves are astringent[257]. An infusion can be used in the treatment of diarrhoea[257]. An infusion of the bark has been used in the treatment of urinary problems[257]. A decoction of the stems has been used as a diuretic[257].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[11, 200]. Plants have biennial stems, they produce a number of new stems from the perennial rootstock each year, these stems fruit in their second year and then die[200]. Often cultivated for its edible fruits in America, it is the parent of many named varieties. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.90 Viburnum lantanoides

Hobbleberry

3 tin 7 cyuc 3 kcaak 0 tcan 1 dwat 3 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli frusflat-  
prik hpa7tmwatli dyatxre7t hjonli

drutta Viburnum lantanoides is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta *Malus pumila paradisica* is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 50]. The fruit can be up to 6cm in diameter[200]. tcanta RootstockCommonly used as a dwarfing rootstock for the cultivated apple, there are several named varieties[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. Commonly cultivated as a rootstock for the cultivated apple, there are several named varieties[200]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.86 *Malus pumila nervosa*

Crab Apple

3 tlin 7 cyuc 3 kcaak 2 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta *Malus pumila nervosa* is a deciduous Tree growing to 5 m (16ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit can be up to 6cm in diameter[200]. Very astringent and quite harsh[K].

tcanta RootstockCan be used as a dwarfing rootstock for the cultivated apples.

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. Plants have been seen

at Kew Gardens bearing huge crops of fruit[K]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.87 *Amelanchier utahensis*

Utah Serviceberry, Coville's serviceberry

3 tlin 7 cyuc 3 kcaak 2 tcan 1 dwat 5 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyfjxre7t hjonli

drutta *Amelanchier utahensis* is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit, raw or cooked[105, 172, 229, 257]. The fruit can also be dried and used as a raisin substitute[177, 183]. The fruit is rich in iron and copper[226]. It is produced in small clusters and is about 10mm in diameter[200].

tcanta WoodWood - heavy, hard and strong. The hardness of the wood makes it suitable for use as the spindle of a fire drill[257]. Trees are seldom large enough to be of commercial interest[229]. The wood has been used to make the rims of baskets[257].

dwatta Ophthalmic OxytoxicAn infusion of the inner bark is used to treat snow-blindness[172]. The plant has been used to ease childbirth during labour and delivery[257].

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not waterlogged[11]. Grows well in heavy clay soils. Tolerates dry soils[200]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. This species is closely related to *A. alnifolia*[11]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 4.2.88 *Viburnum opulus*

Guelder Rose, Cramp Bark, European cranberrybush, American cranberrybush, Crampbark, European Highb

3 tlin 8 cyuc 3 kcaak 3 tcan 3 dwat 5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli fyfjxre7t hjonli

drutta *Viburnum opulus* is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy),

seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Landscape Uses:Arbor. Prefers a sound loamy neutral soil[11, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Another report says that the plant prefers semi-shade[160]. Prefers a sheltered position[200]. When grown in a sunny position the leaves normally develop a strong variegation[219]. Prefers a neutral soil, plants become more variegated when they are grown in a limy soil[200]. Very cold resistant, dormant plants are hardy to at least -30°C but new growth in spring can be cut back by late frosts[74, 160, 200]. Plants grow well on a wall and can also be grown into trees[1]. Cats are very fond of this plant and can damage it by scratching it etc[1, 3, 200]. A very ornamental plant[1], there are some named varieties that have been selected for their edible fruit[183, 200]. The form most often cultivated in this country is a male and it is quite possible that all the plants grown here have been developed from a single clone[219]. Often confused with the closely related *A. polygama*, but it can be distinguished by its leaves which are heart-shaped at the base whilst those of *A. polygama* are tapered[219]. Fruits are produced on second year wood or on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. The flowers are sweetly scented[184]. This is a climbing plant, supporting itself by twining around branches etc[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 4.2.23 *Malus pumila*

Paradise Apple, Common Apple, Apple Tree

3 tlin 9 cyuc 4 kcaak 3 tcan 2 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta *Malus pumila* is a deciduous Tree growing to 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw, cooked in pies, cakes etc or fermented into cider[183]. The taste can be sweet and pleasant. The fruit can be up to 6cm in diameter[200].

tcanta Dye Rootstock WoodUsed as a rootstock for the cultivated apples, there are several named varieties[50]. A yellow dye is obtained from the bark[257]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Landscape Uses: Container, Espalier, Specimen.

dwatta Anthelmintic Antibacterial Bach Hypnotic RefrigerantThe bark, and especially the root bark, is anthelmintic, refrigerant and sporific[218, 240]. An infusion is used in the treatment of intermittent, remittent and bilious fevers[240]. The fruit is said to dispel gas, dissolve mucous, cure flux and be a tonic for anaemia, bilious disorders and colic[218]. The leaves contain up to 2.4% of an antibacterial substance called 'phloretin'[240]. This inhibits the growth of a number of gram-positive and gram-negative bacteria in as low a concentration as 30 ppm[240]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'The cleansing remedy', 'Despondency' and 'Despair'[209].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An overstory and understory tree (can grow and fruit in some shade). An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils.

Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. A parent of the cultivated apple[200], it is occasionally cultivated for its edible fruit and also as a dwarfing rootstock[50]. There are some named forms[200]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Attracts birds, Not North American native, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

#### 4.2.24 Sambucus nigra spp canadensis

American Elder  
 3 tin 9 cyuc 4 kcak 3 tcan 3 dwat 4 m hkuc  
 hmimhtut cyuti tcpw hwicli hrasjltunykfrp hpa7tli flatprik-lwis hpa7tmwatli xre7t hjonli  
 drutta Sambucus nigra spp canadensis is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Fruit ShootsEdible Uses: Drink TeaFruit - raw or cooked[2, 3, 55, 85, 257]. A bitersweet flavour, the fruits are about 5mm in diameter and are borne in large clusters[200, 227]. They are at their best after being dried[62], the fresh raw fruit has a rather rank taste[101]. The fruit is normally cooked and used in pies, jams, jellies, sauces, bread etc[62, 159, 183]. Rich in vitamin C[183]. Some caution is advised, see notes above on toxicity. Flowers - raw or cooked. They are often covered in batter and made into fritters[105]. The flowers can be picked when unopened, pickled and then used as a flavouring in candies etc[149, 227]. They can also be soaked in water to make a drink[149]. A pleasant tasting tea is made from the dried flowers[21, 159, 183, 257]. Young shoots are said to be edible when cooked and to be used as an asparagus substitute[55, 105] though, since the leaves are also said to be poisonous, this report should be viewed with some doubt.

tcanta Compost Dye Hedge Insecticide Musical Pipes Plant breeding RepellentAgroforestry Uses: When grown near a compost heap, the root activity of this plant encourages fermentation in the compost heap[18 ]. Other Uses: The leaves and inner bark of young shoots are used as an insect repellent[6, 101, 149, 159, 257], the dried flowering shoots are said to repel insects and rodents[101]. A decoction of the leaves can be used as an insecticide[201]. It is prepared by boiling 3 - 4 handfuls of leaves in a litre of water, then straining and allowing to cool before applying. Effective against many insects, it also treats various fungal infections such as leaf rot and powdery mildew[201]. A black dye is obtained from the bark[149]. When grown near a compost heap, the root activity of this plant encourages fermentation in the compost heap[18]. The stems can be easily hollowed out to be used as drains in tapping the sap from trees such as the Sugar Maples (*Acer* spp), the stems can also be used as whistles and flutes[149, 159].

dwatta Antidiarrhoeal Antiseptic Cholera Diaphoretic Diuretic Emetic Febrifuge Kidney Laxative Poultrice Purgative Skin Stimulant Vitamin CAmerican elder was widely employed as a medicinal herb by many native North American tribes who used it to treat a wide range of complaints[257]. It is still commonly used as a domestic remedy. A tea made from the inner bark and root bark is diuretic, emetic and a strong laxative[222, 257]. A tea made from the root bark is used to promote labour in childbirth and in treat-

ing headaches, kidney problems and mucous congestion[21, 257]. The inner bark is also applied as a poultice to cuts, sore or swollen limbs etc in order to relieve pain and swelling[222, 257]. A poultice of the leaves is applied to bruises and to cuts in order to stop the bleeding[222]. An infusion of the leaf buds is strongly purgative[21]. Elder flowers are stimulant, diaphoretic and diuretic[213, 257]. A warm tea of the flowers is stimulant and induces sweating, taken cold it is diuretic[21]. It is used in the treatment of fevers and infant colic[257]. An infusion of the leaves and flowers is used as an antiseptic wash for skin problems, wounds etc[21]. The fresh juice of the fruit, evaporated into a syrup, is laxative. It also makes a good ointment for treating burns when mixed with an oily base[21]. The dried fruit can be made into a tea that is useful in the treatment of cholera and diarrhoea[21]. Some caution should be exercised if using any part of the plant fresh since it can cause poisoning[21].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78]. Division of suckers in the dormant season.

nwatta Agroforestry Services: Contour hedgerow Indus Crop: Dye Industrial Crop: Medicinal Management: Standard Regional CropTolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. A very hardy plant, when dormant it tolerates temperatures down to about -34°C[200]. The flowers have a muscatel smell[245]. A fast-growing but short-lived plant[229], it often forms thickets by means of root suckers[200]. It is occasionally cultivated for its edible fruit, there are several named varieties[183], though these have mainly been developed for their ornamental value[182]. Yields of up to 7kg of fruit per tree have been recorded[160]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

#### 4.2.25 x Sorbopyrus hybrid

Pear x mountain ash  
 3 tin 8 cyuc 4 kcak 2 tcan 0 dwat 4 m hkuc  
 htut cyuti tcpw hwicli hrasjltunyk hpa7tli prik hpa7tmwatli hjonli

drutta x Sorbopyrus hybrid is a deciduous Tree growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral soils. It cannot grow in the shade. It prefers moist soil.

members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants produce suckers freely[184]. Plants in this genus are notably susceptible to honey fungus[200].

#### 4.2.83 Malus prunifolia rinkii

Chinese Apple  
 3 tin 7 cyuc 3 kcak 0 tcan 0 dwat 8 m hkuc  
 hmimhtut cyuti tcpw hwicli hrasjltunykfrp hpa7tli flatprik-lwis hpa7tmwatli xre7t hjonli

drutta Malus prunifolia rinkii is a deciduous Tree growing to 8 m (26ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105]. Bitter[200]. Not at all bitter, it makes quite pleasant eating[11]. Used fresh or in preserves etc[22, 46]. The fruit is about 3cm in diameter[200]. Young leaves - cooked[105, 177].

tcanta None known  
 dwatta None known  
 propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[200]. Cultivated for its edible fruit in China, there are many named varieties[11, 22]. This species is a famous fruit tree in N and NE China[266]. Many cultivars have been bred during its long cultivation, the fruit of which differ in shape, color, size, and ripening period[266]. It is also used in apple breeding programmes for its frost resistance[74]. Hybridizes freely with other members of this genus[200]. The fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200].

#### 4.2.84 Prunus americana

American Plum, American Wild Plum, Wild Plum  
 3 tin 8 cyuc 3 kcak 3 tcan 2 dwat 6 m hkuc  
 hmimhtut cyuti tcpw hwicli hrasjltunyk hpa7tli flatprik-lwis hpa7tmwatli xre7t hjonli

drutta Prunus americana is a deciduous Tree growing to 6 m (19ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw, cooked in pies etc or used in preserves[1, 2, 55, 62, 183]. The flesh is succulent and juicy, though it is rather acid with a tough skin[85, 159]. The best forms are pulpy and pleasant tasting[183, 227]. The fruit is best cooked[159], and it can also be dried for later use[85]. The fruit is about 25mm in diameter and contains one large seed[200]. Seed - raw or cooked[85, 183]. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Broom Disinfectant Dye Miscellany Rootstock Soil stabilization WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. A red dye can be obtained from the roots[257]. This species is widely used as a rootstock for cultivated plums in North America[160]. The tough, elastic twigs can be bound into bundles and used as brooms for sweeping the floor[257]. Trees often grow wild along streams, where their roots tend to prevent soil erosion[226]. Wood - heavy, hard, close-grained, strong[82]. It weighs 45lb per cubic foot[227]. Of no commercial value because the trunk is too small[227].

dwatta Antiasthmatic Astringent Disinfectant Diuretic Miscellany PoultriceA tea made from the scraped inner bark is used as a wash to treat various skin problems and as a mouth wash to treat sores[213]. A poultice of the inner bark is disinfectant and is used as a treatment on cuts and wounds[257]. The bark is astringent, diuretic and pectoral[257]. It has been used to make a cough syrup[257]. An infusion has been used in the treatment of diarrhoea, kidney and bladder complaints[257]. An infusion of the twigs has been used in the treatment of asthma[257]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame. Difficult, if not impossible. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Difficult, it not impossible. Suckers in late winter.

nwatta Landscape Uses:Border, Espalier, Pest tolerant, Specimen. Thrives in a well-drained moisture-retentive loamy soil, doing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Trees are probably hardy to as low as -50°C when fully dormant[160]. A fast-growing but short-lived tree in the wild[229], it is cultivated for its edible fruit in N. America, where there are many named varieties[1, 11, 46]. It flowers well in Britain but rarely fruits well here[11]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants often produce suckers at the roots and form thickets[227]. The branches are brittle[101]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, Edible, All or parts of this plant are poisonous, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

#### 4.2.85 Malus pumila paradisiaca

Paradise Apple  
 3 tin 7 cyuc 3 kcak 2 tcan 0 dwat 5 m hkuc



prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil, doing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

### 4.2.81 Prunus cerasus austera

Morello Cherry

3 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Prunus cerasus austera is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Gum Gum Oil Oil TeaFruit - raw or cooked[1, 2, 5, 11, 12]. The fruit is neither bitter nor sweet, but is pleasantly acid[11] and it can be eaten out of hand, used in pies, preserves etc or dried for later use[183]. The fruit has a dark juice[11]. The fruit is about 18mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible oil is obtained from the seed[46, 61]. When refined it is used as a salad oil[183]. The leaves are used as a tea substitute[46, 61, 183]. A gum obtained from the trunk is used for chewing[61, 64].

tcanta Adhesive Dye Gum Gum Hedge Hedge Oil Oil WoodAn edible drying oil obtained from the seed is also used in cosmetics[61]. The gum obtained from the stem is also used as an adhesive[61, 64]. Plants can be grown as a hedge[50], succeeding in fairly exposed positions[K]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers during the dormant season. They can be planted out direct into their permanent positions.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Prefers an acid soil according to another report[5]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Plants succeed when grown against a north-facing wall, the fruit ripens later in this position thus extending the season[11, K]. Hardy to about -20°c[184]. This subspecies covers the cultivated bitter cherries known as Morello cherries[11]. They have been long cultivated for their edible fruit and there are several named varieties[200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants produce suckers freely[184]. Plants in this genus are notably susceptible to honey fungus[200].

### 4.2.82 Prunus cerasus caproniana

Kentish Red Cherry

3 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Prunus cerasus caproniana is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Gum Gum Oil Oil TeaFruit - raw or cooked[1, 2, 5, 11, 12]. Neither bitter nor sweet, the fruit is pleasantly acid and can be eaten out of hand, used in pies, preserves etc or dried for later use[183]. The juice is colourless[11]. The fruit is about 18mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible oil is obtained from the seed[46, 61]. When refined it is used as a salad oil[183]. The leaves are used as a tea substitute[46, 61, 183]. A gum obtained from the trunk is used for chewing[61, 64].

tcanta Adhesive Dye Gum Gum Hedge Hedge Oil Oil WoodAn edible drying oil obtained from the seed is also used in cosmetics[61]. The gum obtained from the stem is also used as an adhesive[61, 64]. Plants can be grown as a hedge[50], succeeding in fairly exposed positions[K]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers during the dormant season. They can be planted out direct into their permanent positions.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Prefers an acid soil according to another report[5]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Hardy to about -20°c[184]. This subspecies covers the cultivated bitter cherries known as Amarelle cherries - this includes those forms grown in Britain as Kentish Red cherries[11]. They have been long cultivated for their edible fruit and there are several named varieties[200]. Most

kcakta Edible Fruit. The fruit is a pome 2.5-3 cm long; it is edible with a sweet, yellowish flesh, which tastes similar to a Nashi Pear.

tcanta A yellow-tan dye is obtained from the leaves[106, 115]. Wood - heavy, tough, durable, fine grained, hard. Used by cabinet and instrument makers[11, 61, 100, 149]. When covered with black varnish it is an excellent ebony substitute[74].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year. The seed of pear cultivars will not usually breed true to type.

nwatta A hybrid of the European Pear (*Pyrus communis*) and the Common Whitebeam (*Sorbus aria*). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. Prefers a good well-drained loam in full sun[1, 200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types, if they are moderately fertile[200], avoiding only the most acid soils[186]. Dislikes very exposed positions[186]. Established plants are drought tolerant[200]. A very hardy plant, tolerating temperatures down to below -15°c[200]. Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-11 indicates that the plant is heat tolerant in zones 11 through 1.) The cultivar Shipova is a small to medium size tree with roundish to slightly pear shaped, seedless, fruit, about the size of a large apricot; skin is a deep yellow with a delicious flavour and delicate rose-like aroma.

## 4.2.26 Hablitzia tamnoides

Caucasian spinach

3 tlin 9 cyuc 4 kcaak 1 tcan 0 dwat 3 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli prikrlwis hpa7tmwatli hjonli

drutta Hablitzia tamnoides is a PERENNIAL CLIMBER growing to 3 m (9ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 6. The flowers are pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible greens and shoots raw or cooked. Mild edible leaves similar to those of the related spinach. Add leaves to a salad. Leaves also used in soups, pies, pizza, indian and oriental food. Young shoots can be eaten.

tcanta Originally introduced to gardens in Finland, Sweden and Norway as an attractive climbing ornamental.

dwatta None known

propta Seed. Germinate at very low temperatures in early spring. Seeds need to be stratified. Cild moist treatment improves germination. Division in autumn

nwatta A woodland climber. Plant in a spot that gets sun for half the day ideally. Plants can tolerate sun for up to two thirds of the day. Will die back in the winter. Plants need something to climb on for example a bamboo trellis.

## 4.2.27 Rhus glabra

Smooth Sumach

3 tlin 9 cyuc 4 kcaak 3 tcan 3 dwat 3 m hkuc htut cyutli kyucutp hwicli hychisrasjlutnyik hpa7tli flatprikrlwis hpa7tmwatli nyanhjen hjonli

drutta Rhus glabra is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 2 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Fruit Oil Root StemEdible Uses: Drink OilFruit - raw or cooked[2, 22, 46]. An acid flavour, it has been used as a substitute for lemon juice[2]. The fruit is rather small and with very little flesh, but it is produced on fairly large panicles and so is easily harvested. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[85, 95, 101, 102, 149, 159, 183]. The mixture should not be boiled since this will release tannic acids and make the drink astringent. Root - peeled and eaten raw[161, 183]. This report should be treated with some caution due to possible toxicity[214]. Young shoots - peeled and eaten raw[183, 257]. This report should be treated with some caution due to possible toxicity[214]. The bark has been eaten as a delicacy by children[257]. This report should be treated with some caution due to possible toxicity[214].

tcanta Dye Hedge Hedge Mordant Oil Pioneer Shelterbelt Soil stabilization Tannin WoodThe leaves are rich in tannin, containing about 10 - 25%[171]. Up to 31.2% has been obtained from some plants[223]. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. The twigs and root are also rich in tannin[149]. A black and a red dye is obtained from the fruit[4, 257]. A black dye is obtained from the leaves, bark and roots[257]. An orange or yellow dye is obtained from the roots harvested in spring[46, 61, 257]. A light yellow dye is obtained from the pulp of the stems[257]. The inner bark, mixed with bloodroot (*Sanguinaria canadensis*) and the inner bark of wild plum (*Prunus sp.*) has been used to make a yellow dye[257]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The plant has an extensive root system and is fairly wind tolerant, though branches can be broken off in very strong winds. It is planted for soil stabilization and as a shelter screen[200]. It can quickly establish itself in open sunny locations and so can be used as a pioneer species for establishing woodlands[229]. Wood - soft, light, brittle[101, 149].

dwatta Alterative Antiseptic Appetizer Astringent Diuretic Dysentery Emetic Emmenagogue Febrifuge Galactogogue Haemostatic Ophthalmic Refrigerant Rubefacient Salve TB TonicSmooth sumach was employed medicinally by various native North American Indian tribes who used it to treat a variety of complaints[257]. It is occasionally used in modern herbalism where it is valued for its astringent and antiseptic qualities. Some caution should be employed in the use of this species since it can possibly cause skin irritations. It is best only used under the supervision of a qualified practitioner. A tea made from the bark or root bark is alterative, antiseptic, astringent, galactogogue, haemostatic, rubefacient and tonic[4, 222, 238, 257]. It is used in the treatment of diarrhoea, fevers, general debility, sore mouths, rectal bleeding, uterine prolapse etc[222, 254]. It is used as a gargle to treat sore throats and applied externally to treat excessive vaginal discharge, burns and skin eruptions[254, 257]. The powdered bark can be applied as a poultice to oral ulcers, it is a good antiseptic[4]. A tea made from the roots is appetizer, astringent, diuretic and emetic[222, 257]. An infusion is used in the treatment of colds, sore throats, painful urination, retention of urine and dysentery[257]. The root is harvested in the autumn and dried for later use[254].

An infusion of the green or dried branches has been used in the treatment of TB[257]. A decoction of the branches, with the seed heads, has been used to treat itchy scalps and as a bathing water for frost-bitten limbs[257]. The milky latex from the plant has been used as a salve on sores[257]. A tea made from the leaves was used in the treatment of asthma, diarrhoea and stomatitis[222]. A poultice of the leaves has been used to treat skin rashes[257]. The leaves have been chewed to treat sore gums and they have been rubbed on the lips to treat sore lips[257]. The berries are diuretic, emetic, emmenagogue, purgative and refrigerant[4, 257]. They are used in the treatment of late-onset diabetes, stranguary bowel complaints, febrile diseases, dysmenorrhoea etc[4, 254, 257]. They have been chewed as a remedy for bed-wetting[222, 257]. The blossoms have been chewed as a treatment for sore mouths[257]. A decoction of the blossoms has been used as a mouthwash for teething children[257]. An infusion of the blossoms has been used as an eye wash for sore eyes[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Landscape Uses:Border, Specimen. Succeeds in a well-drained fertile soil in full sun[11, 200]. Tolerates poor sandy soils[200]. A very hardy plant, when fully dormant it can tolerate temperatures down to at least -25°C[200]. However, the young growth in spring can be damaged by late frosts. A fast-growing but short-lived plant in the wild[229]. Single-stem plants are short-lived in cultivation, but if the plants are coppiced regularly and allowed to form thickets, then they will live longer and also be more ornamental with larger leaves[238]. Any coppicing is best carried out in early spring[238]. It is a very ornamental plant, there are some named varieties[182]. Closely allied to *R. typhina*[11], it hybridizes with that species where their ranges overlap[101, 229]. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. A good bee plant[K]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, *Toxicodendron*, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Attracts birds, North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.28 Vaccinium corymbosum

High-Bush Blueberry, American Blueberry, Swamp Blueberry, Blueberry  
3 tin 8 cyuc 4 kcaak 0 tcan 1 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli dyatxre7t hjonli

drutta Vaccinium corymbosum is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from May to June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked[2, 3, 43, 62, 161]. It is usually sweet and juicy, though the flavour can be variable[11]. It can be used in pies, pastries, cereals, jellies etc[183]. The fruit can also be dried and used like raisins[183]. The fruit is rich in vitamin C[201]. The fruit is about 15mm in diameter[200]. A tea is made from the leaves and dried fruit[101].

tcanta None known  
dwatta Astringent Pectoral Vitamin CAstringent, pectoral[201].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of greenwood, May/June in a shady position in a compost that contains some peat[113]. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Cuttings of mature wood, harvested in November and stored in a fridge then planted in a frame in March. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Landscape Uses: Border, Massing, Seashore. Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Hardy to about -25°C[184]. Often cultivated for its edible fruit in America[183], it is the most common and successful blueberry to be cultivated in Britain[11]. There are many named varieties[183]. A very variable plant, it usually blossoms freely in Britain[11]. Plants are at least partially self-sterile, more than one variety is required in order to obtain good yields of fruit[182]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. leave the fruit on the shrub until the last minute, as the fruit is very acidic and will not ripen after being picked. Does not grow well with blackberries or raspberries[201]. Closely related to *V. atrococcum* and *V. virgatum*[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Edible, Wetlands plant, Attracts butterflies, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown

native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

## 4.2.79 Juniperus scopulorum

Rocky Mountain Juniper, Weeping Rocky Mountain Juniper, Colorado Red Cedar

3 tin 7 cyuc 3 kcaak 4 tcan 2 dwat 10 m hkuc  
htut cyutli hgatkuyctcup hwicli hrasljutnyik hpa7tli flatprinkl-wissip hpa7tmwatli nyanhjen hjonli

druttaJuniperus scopulorum is an evergreen Tree growing to 10 m (32ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from April to May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Coffee Condiment TeaFruit - raw or cooked[105, 161, 183]. Sweet and fleshy, but strongly flavoured[85, 229]. Resinous[227]. Often used as a flavouring, imparting a sage-like taste, for which purpose it is usually dried and ground into a powder[85, 183]. The fruit can also be dried and ground into a meal for making mush and cakes[183].The fruits are about 5 - 8mm in diameter[200, 227]. The roasted fruit is a coffee substitute[183]. A tea is made from the fruits and young shoots[183].

tcanta Beads Disinfectant Incense Parasiticide Repellent Shelterbelt Tinder Wax WoodA fragrant wax on the fruits can be obtained by boiling the fruit and skimming off the wax as it floats to the surface. It is used to make aromatic candles but is only present in small quantities[85]. The boughs are used as an incense to fumigate houses and to drive off smells. The wood can be burnt or just hung in the room, or it can be boiled up in water and the water used to wash the walls, floor etc[99]. The bark is employed as a tinder and is also made into a slow match[216]. The dried seeds have been used as beads or as the 'rattle' in rattles[99, 216]. The fruits and the leaves are used as an insect repellent[169]. A strong infusion of the cones is used to kill ticks[99]. Plants can be grown as a ground cover; the cultivar 'Repens' is especially suitable[208]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. In N. America it is used to some extent in re-afforestation and shelterbelt plantings on the prairies[227]. Wood - extremely tough, aromatic, close grained, light, fairly strong in endwise compression but moderately weak in bending, hard, durable in the soil. Used for interior finishes, bows, hoops, hafts, wheels etc[99, 149, 227].

dwatta Antidandruff Appetizer Diaphoretic Disinfectant Diuretic Haemostatic Kidney Laxative Parasiticide Poultice Sedative Stomachic Tonic VDRocky Mountain juniper was widely employed medicinally by many native North American Indian tribes who used it in particular to treat problems connected with the chest and kidneys[257]. It is little, if at all, used in modern herbalism. A tea made from the terminal shoots has been used in the treatment of VD by some

N. American Indian tribes[213]. The treatment has to be taken over a long period of time[257]. The fruits are appetizer, diuretic and stomachic[257]. An infusion has been used in the treatment of stomach, kidney and bladder problems[213, 257]. An infusion of the twigs has been used in the treatment of fevers, pneumonia, coughs and colds[257]. A poultice of the mashed and dampened branches has been applied to skin sores[257]. The leaves are diaphoretic, disinfectant, febrifuge, haemostatic, laxative, sedative and tonic[99, 216, 257]. A decoction has been used in the treatment of internal bleeding, constipation and constant coughing[257]. The leaves have been boiled, then mixed with turpentine and used as an external treatment on rheumatic joints[257]. The leaves have been rubbed into the hair in order to treat dandruff[213, 257].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Alpine garden, Border, Screen, Specimen, Street tree. Succeeds in moist soils, including chalk[200], so long as they are well drained, preferring a neutral or slightly alkaline soil[1, 11]. A drought tolerant species once established, succeeding in hot dry positions[200]. Plants are fairly wind-resistant[200]. A long-lived but slow-growing tree in its native range[227], it is very slow growing in Britain where it only makes a shrub[185]. Closely allied to *J. virginiana*[1, 81] and hybridising with it where the ranges meet[226]. It differs mainly in the fruit, which takes two years to mature in this species instead of one[226]. Plants are resistant to honey fungus[88]. This tree is apparently resistant to the rust fungus that attacks the closely related *J. virginiana*[149]. Dioecious. Male and female plants must be grown if seed is required. Special Features:North American native, Fragrant foliage, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 4.2.80 Prunus americana lanata

3 tin 7 cyuc 3 kcaak 2 tcan 1 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprinklwis hpa7tmwatli xre7t hjonli

drutta Prunus americana lanata is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[159]. Used mainly in jellies[177]. The fruit is about 25mm in diameter, it has a thick succulent flesh and contains one large seed[82, 200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - heavy, hard, close-grained, strong[82]. The tree is too small for the wood to be of commercial value[229].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and

taken in excess it is purgative[238]. A warm liquid of the gummy sap was drunk as a treatment for gonorrhoea[212]. A tea made from the leaves is antiscorbatic[4, 171]. It is used in the treatment of coughs, colds and fevers[222]. The leaves and young shoots are best harvested in the spring and dried for later use[238]. This plant was widely used medicinally by various North American Indian tribes[257]. The resin was used as an antiseptic healing agent applied externally to wounds, sores, bites etc., it was used as an inhalant to treat headaches and was also taken internally to treat colds, sore throats and various other complaints[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. Stored seeds should be moist stratified 14 - 28 days at 1 - 5°C, though fresh seed may be sown in autumn without stratification, with target seedling densities in the nursery ca 450 - 500/m<sup>2</sup>, often mulched with sawdust. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Of slow initial growth, the stock is usually outplanted as 2- to 3-year-old seedlings or 3- to 4-year-old transplants Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80]. Trees often self-layer in the wild[226], so this might be a means of increasing named varieties in cultivation[K].

nwatta Landscape Uses:Christmas tree, Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Very shade tolerant, especially when young[81, 126], but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200], though the cultivar 'Hudsonia' is more tolerant of alkaline conditions[238]. Prefers growing on a north-facing slope[200]. A shallow-rooted plant, making it vulnerable to high winds[229]. Balsam fir is estimated to tolerate an annual precipitation of 60 to 150cm, an annual temperature range of 5 to 12°C, and a pH of 4.5 to 7.5[269]. The balsam fir is a fast-growing tree in its native environment[229], but it is fairly short-lived and slow growing in Britain, becoming ungainly after about 20 years[11, 64, 81]. It grows best in the Perthshire valleys of Scotland[11, 185]. New growth takes place from late May to the end of July[185]. Trees are very cold hardy but are often excited into premature growth in mild winters and this new growth is susceptible to damage by late frosts[11]. Female strobili may be wholly or partially aborted up to 6 to 8 weeks after bud burst by late spring frosts[269]. Pollen dispersal can be reduced by adverse weather[269]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Trees have a thin bark and are therefore susceptible to forest fires[229]. This species is closely related to *A. fraseri*[11]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones break up on the tree and if seed is required it should be harvested before the cones break up in early autumn[80]. Whilst the typical species is too large for most gardens, there are some named slow-growing dwarf forms that can be grown[238]. Whilst these will not provide the resin, their leaves can be used medicinally[K]. The leaves are strongly aromatic of balsam when crushed[185]. The tree is sometimes grown and used as a 'Christmas tree'[226]. Special Features: North American native, There are no flowers or blooms.

## 4.2.78 Betula alleghaniensis

Yellow Birch, Swamp Birch  
3 tin 7 cyuc 3 kcaak 4 tcan 2 dwat 12 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikli-wis hpa7tmwatli hjonli

drutta Betula alleghaniensis is a deciduous Tree growing to 12 m (39ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Inner bark SapEdible Uses: Condiment Sweetener Tealnrn bark - cooked or dried and ground into a powder and used with cereals in making bread[62]. Inner bark is generally only seen as a famine food, used when other forms of starch are not available or are in short supply[K]. Sap - raw or cooked. A sweet flavour[62, 102, 161, 177]. The sap is harvested in early spring, before the leaves unfurl, by tapping the trunk. It flows abundantly, but the sugar content is much lower than maple sap[226]. A pleasant drink, it can also be concentrated into a syrup or fermented into a beer[183, 226]. An old English recipe for the beer is as follows:- "To every Gallon of Birch-water put a quart of Honey, well stirr'd together; then boil it almost an hour with a few Cloves, and a little Limon-peel, keeping it well scumm'd. When it is sufficiently boil'd, and become cold, add to it three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it up. . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk ante pastum."[269]. A tea is made from the twigs and leaves[62, 177]. The dried leaves are used according to another report[183]. An excellent flavour[226]. The twigs and leaves have the flavour of wintergreen and can be used as condiments[183].

tcanta Containers Fuel Waterproofing WoodThe bark is waterproof and has been used by native peoples as the outer skin of canoes, as roofing material on dwellings and to make containers such as buckets, baskets and dishes[257]. Wood - close-grained, very strong, hard, heavy. The wood is too dense to float[226]. An important source of hardwood lumber, it is used for furniture, boxes, tubs of wheels, floors etc[46, 61, 82, 171, 229]. It is also often used as a fuel[46, 61]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiseborrheic Cathartic EmeticYellow birch is little used medicinally, though a decoction of the bark has been used by the native North American Indians as a blood purifier, acting to cleanse the body by its emetic and cathartic properties[257]. The bark is a source of 'Oil of Wintergreen'[226]. This does have medicinal properties, though it is mainly used as a flavouring in medicines[226].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Landscape Uses:Specimen, Woodland garden. Succeeds in a well-drained loamy soil in a sheltered position[11, 200]. Grows well in heavy clay soils. Dislikes wet soils[200]. Shade tolerant[200]. A slow-growing tree, it is relatively long-lived for a birch, with specimens 200 years old recorded[229]. Plants often grow taller than the 12 metres mentioned above[229]. The trees are highly susceptible to forest fires, even when wet the bark is highly inflammable[226]. The bruised foliage has a strong smell of wintergreen[200]. Hybridizes freely with other members of this genus[50]. Trees are notably susceptible to honey fungus[200]. Special Features: Attracts birds, North American

[1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 4.2.29 Rubus canadensis

American Dewberry, Smooth blackberry  
3 tin 7 cyuc 4 kcaak 1 tcan 1 dwat 2.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Rubus canadensis is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, jams etc[2, 3, 43, 105, 183]. Sweet, juicy and richly flavoured, it is generally preferred to most other species of blackberries[2, 183]. The fruit can be pressed into cakes and then dried for later use[257]. The fruit can be up to 25mm long[235].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta Astringent DysenteryThe stems and the fruit have been used in the treatment of dysentery[257]. A decoction of the root has been used in the treatment of dysentery[257].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. This species is a blackberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. The stems are free from prickles[235]. The plant produces apomictic flowers, these produce fruit and viable seed without fertilization, each seedling is a genetic copy of the parent[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.30 Arctium lappa

Great Burdock, Gobo  
3 tin 7 cyuc 4 kcaak 2 tcan 5 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Arctium lappa is a BIENNIAL growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves Root Seed StemEdible Uses: Root - raw or cooked[2, 7, 9, 14, 179]. Very young roots can be eaten raw, but older roots are normally cooked[206]. They can be up to 120cm long and 2.5cm wide at the top, but are best harvested when no more than 60cm long[206]. Old and very long roots are apt to become woody at the core[206]. Although it does not have much flavour the root can absorb other flavours[116]. Young roots have a mild flavour, but this becomes stronger as the root gets older[206]. The root is white but discolours rapidly when exposed to the air[206]. Roots can be dried for later use[213]. They contain

about 2.5% protein, 0.14% fat, 14.5% carbohydrate, 1.17% ash[179]. The root contains about 45% inulin[240]. Inulin is a starch that cannot be digested by the human body, and thus passes straight through the digestive system. In some people this starch will cause fermentation in the gut, resulting in wind[K]. Inulin can be converted into a sweetener that is suitable for diabetics to eat[K]. Young leaves - raw or cooked[9, 12, 14, 62]. A mucilaginous texture[179]. The leaves contain about 3.5% protein, 1.8% fat, 19.4% carbohydrate, 8.8% ash[179]. Young stalks and branches - raw or cooked[2, 9, 52, 55, 62]. Used like asparagus or spinach[12, 183]. They taste best if the rind is removed[85, 117]. The leaf stalks can be parboiled and used as a substitute for cardoons[183]. The pith of the flowering stem can be eaten raw in salads, boiled or made into confections[4, 183]. A delicate vegetable, somewhat like asparagus in flavour[4]. The seeds can be sprouted and used like bean-sprouts[12, 52, 183].

tcanta HairThe juice of the plant, when used as a friction, is said to have a stimulating action against baldness[7].

dwatta Alterative Antibacterial Antifungal Antiphlogistic Antipsoriatic Aperient Blood purifier Carminative Cholagogue Depurative Diaphoretic Diuretic Eczema Hypoglycaemic StomachicBurdock is one of the foremost detoxifying herbs in both Chinese and Western herbal medicine[254]. The dried root of one year old plants is the official herb, but the leaves and fruits can also be used[4]. It is used to treat conditions caused by an 'overload' of toxins, such as throat and other infections, boils, rashes and other skin problems[254]. The root is thought to be particularly good at helping to eliminate heavy metals from the body[254]. The plant is also part of a North American formula called es-siac which is a popular treatment for cancer. Its effectiveness has never been reliably proven or disproven since controlled studies have not been carried out. The other herbs included in the formula are Rumex acetosella, Ulmus rubra and Rheum palmatum[254]. The plant is antibacterial, antifungal, carminative[9, 21, 147, 165, 176]. It has soothing, mucilaginous properties and is said to be one of the most certain cures for many types of skin diseases, burns, bruises etc[4, 244]. It is used in the treatment of herpes, eczema, acne, impetigo, ringworm, boils, bites etc[244]. The plant can be taken internally as an infusion, or used externally as a wash[244]. Use with caution[165]. The roots of one-year old plants are harvested in mid-summer and dried. They are alterative, aperient, blood purifier, cholagogue, depurative, diaphoretic, diuretic and stomachic[218, 222]. The seed is alterative, antiphlogistic, depurative, diaphoretic and diuretic[218]. Recent research has shown that seed extracts lower blood sugar levels[238]. The seed is harvested in the summer and dried for later use[254]. The crushed seed is poulticed onto bruises[222]. The leaves are poulticed onto burns, ulcers and sores[222].

propta Seed - best sown in situ in the autumn[200]. The seed can also be sown in spring[206]. Germination can be erratic, it is best to sow the seed in trays and plant out the young plants before the tap-root develops[206]. Seed requires a minimum temperature of 10°C, but a temperature of 20 - 25°C is optimum[206]. Germination rates can be improved by pre-soaking the seed for 12 hours or by scarification[206]. They germinate best in the light[206]. The autumn sowing should be made as late as possible because any plants with roots more than 3mm in diameter in the spring will quickly run to seed if cold temperatures are followed by daylengths longer than 12½ hours[206].

nwatta Succeeds in most soils when grown in partial shade[200]. Prefers a moist neutral to alkaline soil[238] and a sunny position in a heavy soil[22]. Plants are best grown in a light well-drained soil if the roots are required for culinary use[200, 206]. Tolerates a pH in the range 4.6 to 7.8. The top growth dies back at temperatures a little above freezing, but the roots tolerate much lower temperatures[206] and can be left in the ground all winter to be harvested as required. Burdock is cultivated for its edible root in Japan, there are some named varieties[183]. Spring-sown seed produces edible roots in late summer and autumn, whilst autumn sown crops mature in the following spring or early summer[206]. Although the plants are quite large, it is best to grow them fairly close together (about 15cm apart, or in rows 30cm apart with the plants 5 - 8cm apart in the rows) since this encourages the development of long straight roots[206]. The seed head has little hooked prickles and these attach themselves to the hairs or clothing of passing creatures and can

thus be carried for some considerable distance from the parent plant[4]. The plants usually self-sow freely[238]. The flowers are very attractive to bees and butterflies[206]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 4.2.31 Ribes aureum

Golden Currant

3 tlin 8 cyuc 4 kcaak 0 tcan 1 dwat 2.4 m hkuc hmimhtut cyuti kyuctup hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Ribes aureum is a deciduous Shrub growing to 2.4 m (7ft 10in). See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in April, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers FruitEdible Uses: Fruit - raw or cooked[2, 11, 62, 101, 257]. They make an acceptable dessert fruit[K] and are also used in jellies, sauces and pies[183]. The fruit can also be dried for winter use[46, 85]. Fairly large and flavourful[85, 183]. The fruit is about 5mm in diameter[200]. Flowers - raw. A very sweet flavour[85].

tcanta None known

dwatta Antinflammatory SalveThe dried and pulverized inner bark has been sprinkled on sores[257]. A decoction of the inner bark has been used in the treatment of leg swellings[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at -2 to +2°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11]. Succeeds in full sun but is also quite tolerant of shade though not fruiting so well in such a position[11]. Grows well on exposed dry sites[85]. Very tolerant of being transplanted[85]. Plants can spread by means of underground rhizomes, especially when growing in moist conditions[164]. Hardy to about -20°C[200]. The fruit can be red, black, yellow, golden or reddish-brown[164]. A very ornamental plant[1], it is closely allied to *R. odoratum*[11]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Sometimes cultivated for its edible fruit, there are some named varieties[183]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down

and out [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 4.2.32 Lonicera caerulea

Sweetberry honeysuckle, Bluefly honeysuckle, Haskap berry 3 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 2 m hkuc htut cyuti tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli dyakre7t hjonli

drutta Lonicera caerulea is a deciduous Shrub growing to 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: The following report is for the closely related *L. villosa*, it would be worthwhile experimenting with this plant to check on edibility[K]. The fruit of this species is about 5mm in diameter[235]. Fruit - raw or preserved[43, 105, 200]. A milder flavour than most edible honeysuckles, they can be eaten raw but are mainly used in making jams, jellies and refreshing drinks[183].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200]. Closely related to *L. villosa*[200]. Interesting botanically because it appears as though two flowers arise from a single ovary[11]. The fruit is actually a fleshy growth that surrounds the two ovaries[11]. A very variable species[11], there are some named forms selected for their ornamental value[200]. Plants of many haskap cultivars grow to be 1.5 to 2 meters tall and wide, can survive a large range of soil acidity, from 3.9-7.7 (optimum 5.5-6.5), requiring high organic matter, well drained soils, and plentiful sunlight for optimum productivity. *Lonicera caerulea* plants are more tolerant of wet conditions than most fruit species. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 4.2.33 Amaranthus cruentus

Purple Amaranth, Red amaranth

3 tlin 11 cyuc 4 kcaak 2 tcan 2 dwat 2 m hkuc htut cyuti tcup hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli fyif hjonli

drutta Amaranthus cruentus is a ANNUAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Colouring/Leaves - cooked as a spinach[183]. The mild-flavoured leaves are rich in vitamins and minerals[183]. Seed - very small but easy to harvest and very nutritious. They are eaten

### 4.2.76 Quercus x hebbiana

3 tlin 7 cyuc 3 kcaak 0 tcan 2 dwat 15 m hkuc hmimhtut cyuti hgaktyuctup hwicli jltunykfrp hpa7tli flat-priklwis hpa7tmwatli hjonli

drutta Quercus x hebbiana is a deciduous Tree growing to 15 m (49ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[183]. The large seeds are sweet and can be eaten out of hand[183]. The seed can be ground into a powder and used in making bread, dumplings etc and as a thickener in soups[183]. If the seed is bitter then this is due to the presence of tannins, these can be leached out by thoroughly washing the dried and ground up seed in water, though many minerals will also be lost. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - hard, heavy, strong, tough, very durable, close grained.

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly. This species is a hybrid and may not breed true from seed[K].

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Lime tolerant[188]. Succeeds in a hot dry position. Young plants tolerate reasonable levels of shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. A vigorous, fast-growing hybrid species, some forms are capable of reaching 1.5 metres tall in 2 years[183.]. Established plants are drought resistant[229] and tolerant of atmospheric pollution[226]. This species is occasionally cultivated for its edible seed, there are some named varieties[183]. It is a hybrid of garden origin, *Q. alba* x *Q. macrocarpa*[183]. Both of its parents prefer warmer summers than are usually experienced in Britain, often growing poorly in this country and failing to properly ripen their wood, resulting in frost damage overwinter[11, 200]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 4.2.77 Abies balsamea

Balsam Fir

3 tlin 6 cyuc 3 kcaak 0 tcan 5 dwat 15 m hkuc pcmhmimhtut cyuti tcup hwicli hrasjlutnyikfrp hpa7tli flat-priklwis hpa7tmwatli hjonli

drutta Abies balsamea is an evergreen Tree growing to 15 m (49ft) by 5 m (16ft) at a slow rate. See above for USDA

hardness. It is hardy to UK zone 2 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant is not wind tolerant.

kcakta Edible Parts: Inner barkEdible Uses: Condiment Gum Tealinner bark - cooked. It is usually dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 177]. Fir bark is a delight to chew in winter or early spring, slightly mucilaginous and sweetish, better raw than cooked[269]. Another report says that it is an emergency food and is only used when all else fails[183]. An aromatic resinous pitch is found in blisters in the bark[64]. When eaten raw it is delicious and chewy[101, 183]. Another report says that the balsam or pitch, in extreme emergency, forms a highly concentrated, though disagreeable, food[269]. An oleoresin from the pitch is used as a flavouring in sweets, baked goods, ice cream and drinks[183]. Tips of young shoots are used as a tea substitute[177, 183].

tcanta Adhesive Fibre Gum Kindling Microscope Repellent Resin Stuffing Waterproofing WoodThe balsamic resin 'Balm of Gilead'[11, 46] or 'Canada Balsam' according to other reports[64, 226, 238] is obtained during July and August from blisters in the bark or by cutting pockets in the wood[222]. Another report says that it is a turpentine[171]. The term Canada Balsam is a misnomer because balsams are supposed to contain benzoic and cinnamic acids, both absent from the Canada oleoresin[269]. Turpentine is also a misnomer, implying that the oleoresin is entirely steam volatile. Actually it contains 70 - 80% resin, only 16 - 20% volatile oil[269]. Canada Balsam yields 15 - 25% volatile oil, the resin being used for caulking and incense[269]. It is used medicinally and in dentistry, also in the manufacture of glues, candles and as a cement for microscopes and slides - it has a high refractive index resembling that of glass[11, 46, 64, 82, 222, 226, 238]. The pitch has also been used as a waterproofing material for the seams of canoes[257]. The average yield is about 8 - 10 oz per tree[171]. The resin is also a fixative in soaps and perfumery[171, 238]. "Turpentine" is usually collected during July-August by breaking the turpentine blisters into small metal cans with sharp-pointed lids. Trees are then allowed to recuperate for 1 - 2 years before being harvested again[269]. The leaves and young branches are used as a stuffing material for pillows etc - they impart a pleasant scent[46, 61, 257] and also repel moths[169]. The leaves contain an average of 0.65% essential oil, though it can go up to 1.4% or even higher[269]. One analysis of the essential oils reports 14.6% bornyl acetate, 36.1% b-pinene, 11.1% 3-carene, 11.1% limonene, 6.8% camphene, and 8.4% a-pinene[269]. To harvest the oil, it would appear that the branches should be snipped off younger trees in early spring[269]. Fifteen year old trees yield 70% more leaf oil than 110-year-old trees; oil yields are highest in January - March and September, they are lowest from April to August[269]. A thread can be made from the roots[257]. Wood - light, soft, coarse grained, not strong, not very durable. Weighs 24lb per cubic foot[235]. Used mainly for pulp, it is not used much for lumber except in the manufacture of crates etc[46, 82, 226, 229]. The wood is commercially valuable for timber even though it is relatively soft, weak, and perishable[269]. Balsam fir is used in the US for timber and plywood, and is the mainstay of the pulp wood industry in the Northeast. The wood, which is rich in pitch, burns well and can be used as a kindling[257]

dwatta Analgesic Antiscurbutic Antiseptic Diuretic Poulitice Stimulant Tonic VDTThe resin obtained from the balsam fir (see 'Uses notes' below) has been used throughout the world and is a very effective antiseptic and healing agent. It is used as a healing and analgesic protective covering for burns, bruises, wounds and sores[213, 222, 226]. It is also used to treat sore nipples[213] and is said to be one of the best curatives for a sore throat[245]. The buds, resin, and/or sap are used in folk remedies for treating cancers, corns, and warts[269]. The resin is also antiscorbatic, diaphoretic, diuretic, stimulant and tonic[4, 171, 222]. It is used internally in propriety mixtures to treat coughs and diarrhoea, though

have lost most of its astringency. The roasted seed is a coffee substitute.

**tcanta** **Mordant Repellent Tannin WoodAgroforestry** Uses: The tree has been widely tested for use in rehabilitation of the soil. It has been successfully planted on coal spoils in the north-central and northern Great Plains, and in the Western Interior Coal Province which encompasses Missouri, Kansas, and Oklahoma. It may be either seeded or transplanted onto disturbed areas[1050 ]. Other Uses: The leaves of most species in this genus are more or less rich in tannins. A mulch of the leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc. Fresh leaves should be used with caution, since these can utilize some of the nitrogen in the soil and this inhibit plant growth[20 , K 1]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4 ]. The bark has been used as a mordant for fixing dyes[257 ]. The wood is hard, heavy, strong, tough, very durable, close grained. It weighs about 46lb per cubic metre[227 ]. This species is of considerable importance as a timber tree, it is used for all types of construction, in making baskets, flooring, cabinet making, ship building, cooperage fence posts etc[46 , 61 , 82 , 149 , 171 , 227 , 229 , 338 ]. The wood is a good fuel[82 ].

**dwatta** **Antispasmodic Astringent Dysentery Tonic**The bark is astringent and tonic[61]. An infusion has been used in the treatment of diarrhoea[257]. A decoction of the root or inner bark has been used in the treatment of cramps[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

**propta** **Seed** - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

**nwatta** **Landscape** Uses:Firewood. Pest tolerant. Aggressive surface roots possible, Specimen. Prefers a good deep fertile loam which can be on the stiff side[11]. Lime tolerant[188]. Succeeds in a hot dry position. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. A slow-growing tree[188]. Established plants are drought resistant[229] and tolerant of atmospheric pollution[226]. Trees have a thick, fire-resistant bark[274]. Occasionally cultivated for its edible seed, there are some named varieties[183]. Slow growing in the wild, it takes about 30 years to start producing seed, though it then continues to crop for the next 200 - 300 years with large crops being produced every 2 - 3 years[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Prefers warmer summers than are usually experienced in Britain, often growing poorly in this country and failing to properly ripen its wood, resulting in frost damage overwinter[11, 200]. A tree at the Hillier Arboretum in Hampshire was growing well in September 1993. It was 9 metres tall but had a lot of mildew, there was no sign of seeds[K]. There is a dwarf form of this species:- *Q. macrocarpa depressa* (Nutt.)Engelm. grows about 2 metres tall with corky branches and smaller seeds than the species, usually about 1cm long[227]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as

the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.75 Vitis aestivalis

**Summer Grape, Long grape**

3 tlin 7 cyuc 3 kcaok 0 tcan 1 dwat 20 m hkuc hmimhtut cyutli kyuctup hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwathi xre7t hjonli

**drutta** *Vitis aestivalis* is a deciduous Climber growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcaakta** **Edible Parts:** Fruit Leaves Sap**Edible** Uses: Fruit - raw, cooked in jellies, jams, pies etc or dried for later use[1, 2, 22, 46, 183]. Agreeably flavoured[11, 200]. The taste is best after a frost[101]. The dried fruits are eaten as snacks or used in baked goods[183]. The fruit is about 8mm in diameter[200] and is produced in fairly large bunches[235]. Leaves - cooked[55, 159]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. A sweet watery sap is obtained from the stem[101, 183]. Used as a refreshing drink. Young tendrils - raw or cooked[55, 85, 159].

**tcanta** **Dye**A yellow dye is obtained from the fresh or dried leaves[168].

**dwatta** **Diuretic Febrifuge Hepatic Poulitice Stomachic Urinary**The leaves are hepatic[257]. They have been used in the treatment of the liver[257]. The wilted leaves have been applied as a poultice to the breasts to draw away soreness after the birth of a child[257]. A decoction of the leaves and stems has been taken in the treatment of stomach aches, fevers and headaches[257]. An infusion of the bark has been used to treat urinary complaints[257].

**propta** **Seed** - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

**nwatta** **Prefers** a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. They grow particularly well up elm trees[18]. The flowers are sweetly scented with the aroma of mignonette[245]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This species is a parent of some cultivars that are grown for their edible fruits in N. America[1, 61]. Resistant to Phylloxera disease, a disease that almost destroyed the European grape crops[61]. This species can be used as a rootstock in areas where the disease is prevalent and can also be used in breeding programmes with *V. vinifera* in order to impart resistance to that species[183]. Plants in this genus are notably susceptible to honey fungus[200].

cooked or ground into a powder and used for making cakes etc[183, 257]. They can also be sprouted and used in salads[183]. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K]. The flowers are used as a food colouring in ceremonial maize bread[183].

**tcanta** **Dye**Yellow and green dyes can be obtained from the whole plant[168].

**dwatta** The plant can be cultivated from the tropics to the temperate zone. It grows best in areas where annual daytime temperatures are within the range 22 - 28°C, but can tolerate 10 - 45°C[418 ]. It can be killed by temperatures of 4°C or lower[418 ]. It prefers a mean annual rainfall in the range 2,000 - 2,400mm, but tolerates 500 - 4,000mm[418 ]. Prefers a well-drained fertile soil in a sunny position[200 ]. Requires a hot sheltered position if it is to do well[K ]. Prefers a pH in the range 5.5 - 7, tolerating 4.3 - 7.5[418 ]. Often cultivated as a food crop and ornamental plant, it has escaped from cultivation in many areas and become naturalised as a weed of cultivated and disturbed ground[305 ]. A fast-growing plant, the first crop of leaves can be harvested in 30 - 50 days from sowing the seed, and the plant can carry on being harvested for up to another 250 days[418 ]. Grain yields usually range from 800-1200 kg/ha but with the use of fertilizers the yield can be raised up to 3 t/ha. This species is cultivated for its edible seed in many parts of S. America and in Japan[58 , 97 , 183 ]. There is at least one named variety, 'Oeschberg' is a very productive plant, growing 1 metre tall and can yield up to 2.5 tonnes per hectare[183 ]. This species is the most adaptable of the grain amaranths, it also flowers under a wider range of daylength hours than the other species[183 ]. Plants are particularly susceptible to attacks by leaf-chewing insects[298 ]. Plants should not be given inorganic fertilizers, see notes above on toxicity. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196 ].

**propta** **Seed** - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

**nwatta** **Prefers** a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Tolerates a pH in the range 4 to 7.5. Plants should not be given inorganic fertilizers, see notes above on toxicity. This species is cultivated for its edible seed in many parts of S. America and in Japan[58, 97, 183]. There is at least one named variety, 'Oeschberg' is a very productive plant, growing 1 metre tall and can yield up to 2.5 tonnes per hectare[183]. This species is the most adaptable of the grain amaranths, it also flowers under a wider range of daylength hours than the other species[183]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 4.2.34 Cichorium intybus

**Chicory, Radicchio, Succory, Witloof**

3 tlin 7 cyuc 4 kcaak 3 tcan 3 dwat 1.5 m hkuc htut cyutli hcup hwicli hrasljutnyik hpa7tli frusflatprikliwsslip hpa7tmwathi fyixre7t hjonli

**drutta** *Cichorium intybus* is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees.

The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers moist soil.

**kcaakta** **Edible Parts:** Flowers Leaves Root**Edible** Uses: CoffeeLeaves - raw or cooked[2, 4, 5, 9, 27, 33, 171]. The leaves are rather bitter, especially when the plants are flowering[4]. The leaves are often blanched by excluding light, either by removing all the leaves and then earthing up the new growth, or by covering the plant with a bucket or something similar. Whilst this greatly reduces any bitterness, there is also a corresponding loss of vitamins and minerals[K]. The blanched leaves are often used in winter salads (they are known as chicons) and are also cooked[132, 200]. The unblanched leaves are much less bitter in winter and make an excellent addition to salads at this time of year[K]. A nutritional analysis of the leaves is available[218]. Flowers - raw[52]. An attractive addition to the salad bowl[183], but rather bitter[K]. Root - cooked like parsnip[5, 7, 9, 13, 21, 27, 46]. The boiled young roots form a very palatable vegetable[4]. The root is said to be an ideal food for diabetics because of its inulin content[9]. Inulin is a starch that cannot be digested by humans, it tends to pass straight through the digestive system and is therefore unlikely to be of use to a diabetic[K]. However, the inulin can be used to make a sweetener that is suitable for diabetics to use[K]. Chicory-root is free of harmful ingredients, and is essentially a concentrated combination of three sugars (pentose, levulose and dextrose) along with taraxacine (the bitter principle of dandelion)[269]. It is especially important as source of levulose[269]. Roots are used in seasoning soups, sauces and gravies, and to impart a rich deep colour[269]. The roasted root is used as a caffeine-free coffee adulterant or substitute[2, 4, 5, 7, 13, 21, 27, 46]. Young roots have a slightly bitter caramel flavour when roasted, roots over 2 years old are much more bitter[238].

**tcanta** **Biomass Compost**The roots have the potential to be used for the production of biomass for industrial use[132]. They are rich in the starch 'inulin' which can easily be converted to alcohol[269]. A blue dye has been obtained from the leaves[4]. The flowers are an alternative ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Nectary. Insect shelter.

**dwatta** **Appetizer Bach Cardiac Cholagogue Depurative Digestive Diuretic Hypoglycaemic Laxative Tonic** WartsChicory has a long history of herbal use and is especially of great value for its tonic affect upon the liver and digestive tract[254]. It is little used in modern herbalism, though it is often used as part of the diet. The root and the leaves are appetizer, cholagogue, depurative, digestive, diuretic, hypoglycaemic, laxative and tonic[4, 7, 9, 13, 21, 46, 222]. The roots are more active medicinally[222]. A decoction of the root has proved to be of benefit in the treatment of jaundice, liver enlargement, gout and rheumatism[4]. A decoction of the freshly harvested plant is used for treating gravel[4]. The root can be used fresh or dried, it is best harvested in the autumn[9]. The leaves are harvested as the plant comes into flower and can also be dried for later use[9]. The root extracts have experimentally produced a slower and weaker heart rate (pulse)[222]. The plant merits research for use in heart irregularities[222]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Possessiveness', 'Self-love' and 'Self-pity'[209]. The latex in the stems is applied to warts in order to destroy them[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Cichorium intybus* for loss of appetite, dyspepsia (see [302] for critics of commission E).

**propta** **Seed** - sow the wild form or cultivars being grown for their roots in May or June in situ. Cultivars being grown for their edible leaves can be sown in April for a summer crop or in June/July for a winter crop. Sow them in situ or in pots and then plant them out as soon as they are large enough.

**nwatta** **Prefers** a sunny position in any moderately fertile well-drained moisture retentive soil[1, 14, 52]. Prefers a pH 5.5 to 7[200]. Tolerates a pH in the range 4.5 to 8.3. Chicory

grows on any type of soil but, when cultivated, grows best on mellow, deeply tilled, fertile soil or sandy loam[269]. A cool weather crop, it tolerates only moderate summer temperatures and requires well-distributed rainfall, with good drainage, or some irrigation in drier areas[269]. Chicory roots deeply in relatively short time; soil too wet for beans and small grains is not suitable[269]. To insure proper root-growth, apply lime or marl to acid soil to neutralize acidity[269]. Chicory is reported to tolerate a pH in the range of 4.5 to 8.3, an annual rainfall of 30 to 400 cm and an annual mean biotemperature of 6° to 27°C[269]. Chicory is an excellent winter salad. It is often cultivated, especially in Europe, for its edible leaves and for its roots which are used to make a coffee substitute. There are many named varieties[46, 132, 183] and, by careful selection of cultivars and sowing times, fresh leaves can be obtained all year round. There are three main types of chicory grown for their leaves, there are many cultivars of each form:- A bitter-tasting loose-leaved form is grown as a green winter vegetable, especially in southern Italy. A narrow-leaved, witloof or Belgian form has a compact elongate head (chicon) which is blanched for use in salads or cooked dishes. A broad-leaved (usually red) form produces cabbage-like hearts, these are generally less bitter than the other forms and are eaten raw or cooked. These forms are often used as a winter salad crop[K]. Although a perennial, chicory is usually cultivated as an annual crop, especially when being grown as a winter salad. The winter salad cultivars are usually sown in early summer to make sure that they do not flower in their first year of growth. By late autumn they have formed an overwintering rosette of leaves rather like a cabbage. These leaves can be harvested as required during the winter and the plants will then usually make some new growth (as long as the winter is not too cold) that can be harvested in late winter or early spring. The plants run to flower in the following summer and fail to make an overwintering rosette of leaves for that winter[K]. Chicory can be grown successfully in a meadow or even in a lawn so long as the grass is not cut too short nor too often[K]. It often self-sows freely when well-sited, especially if it is growing in a dry alkaline soil[238]. A good bee plant[24, 108]. A very ornamental plant[1]. The flowers open in the early morning (about 6 - 7 o'clock in Britain) and close around midday[4]. Special Features: Edible, Not North American native, Invasive, Naturalizing. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 4.2.35 Rheum x cultorum

Rhubarb  
 3 tin 7 cyuc 4 kcaak 2 tcan 3 dwat 1.5 m hkuc  
 hmimhtut cyutli tcup hwicli jlytnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rheum x cultorum is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from February to October, in flower in June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers StemEdible Uses: Colouring RutinLeaf stem - raw or cooked[1, 2, 46, 105, 200]. An acid taste, it is used as a fruit substitute in spring, usually stewed with sugar and used in pies, jams etc[183]. The juice

strained from stewed rhubarb can add colour and flavour to a fruit punch[183]. It is best not to eat large quantities of the stems because of their oxalic acid content - see the notes above on toxicity. Immature flowers - cooked and used like cauliflower[183]. One report says that the plant contains 0.7% rutin[240]. It does not specify which part of the plant, though it is likely to be the leaves[K].

tcanta InsecticideThe leaves can be simmered in hot water to make an insecticide.

dwatta Anticholesterolemic Antiseptic Antispasmodic Antitumor Aperient Astringent Cholagogue Demulcent Diuretic Homeopathy Laxative Purgative Stomachic TonicThe roots of many members of this genus are used medicinally. Whilst *R. palmatum* is the main species used in China, we have a report that this species (which has probably been derived from it through cultivation) is used in Korea[279]. The uses of *R. palmatum* are as follows:- Chinese rhubarb, called Da Huang in China, has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[238]. It has a safe and gentle action, safe even for children to use[254]. The plant is also part of a North American formula called *essiac* which is a popular treatment for cancer. Its effectiveness has never been reliably proven or disproven since controlled studies have not been carried out. The other herbs included in the formula are *Arctium lappa*, *Ulmus rubra* and *Rumex acetosella*[254]. The root is anticholesterolemic, antiseptic, antispasmodic, antitumor, aperient, astringent, cholagogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 7, 9, 21, 91, 171, 176, 238]. The roots contain anthraquinones, which have a purgative effect, and also tannins and bitters, which have an opposite astringent effect[244]. When taken in small doses, it acts as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232, 244]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. This species is a hybrid and will not necessarily breed true to type from seed. However, this does give the opportunity to look for superior plants from amongst the seedlings. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta A very easily grown plant, tolerant of considerable neglect, it prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200, 264]. It succeeds in most soils provided the drainage is good[200] and will grow in the dappled shade of trees so long as there is sufficient side light[K]. It grows well in heavy clay soils. Tolerates acid conditions but prefers a pH in the range 6.5 to 7[200]. Plants are very cold hardy, tolerating temperatures down to at least -20°C[200]. The plant does not like hot summers, however, and is likely to die in warmer climates[264]. Rhubarb is a long-lived and almost indestructible perennial plant[264]. It is often cultivated for its edible leaf stems, there are many named varieties[74, 183]. Most cultivars produce edible stems from spring to early summer, though 'Glaskin's Perpetual' can be harvested throughout the summer. By digging up the roots in the autumn and exposing them to frost, earlier growth will be initiated. These roots can then be transferred to a cold frame or other protected area where they will produce their edible stems in late winter. It is also possible to produce earlier crops outdoors by covering

dwatta Miscellany VDAAn extract obtained from the wood has been used in the treatment of jaundice[226]. A decoction of the bark has been used in the treatment of sore throats[257]. When combined with powdered shells it has been used to treat VD[257].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Landscape Uses:Firewood, Aggressive surface roots possible, Street tree, Woodland garden. Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Tolerates alkaline soils[160]. Established plants are very drought resistant[149, 160, 200]. Wind resistant[160]. Trees transplant easily[226]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. Plants in the wild are very variable in size, ranging from small shrubs to large trees[43]. They are fast-growing[98, 229], and can be very long-lived, perhaps to 1000 years[200]. Only to 200 years according to another report[229]. They usually produce good crops of fruit annually[229]. Trees respond well to coppicing, readily sending up suckers after cutting or the top being killed off in a fire[226]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Naturalizing, Wetlands plant, Attracts butterflies, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

### 4.2.73 Tilia mongolica

Mongolian Lime  
 3 tin 6 cyuc 3 kcaak 0 tcan 1 dwat m hkuc  
 hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Tilia mongolica* is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves and shoots - raw or cooked[105]. An emergency food, it is only used when all else fails[177]. A refreshing herb tea is made from the flowers. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta FibreA fibre is obtained from the tough inner bark. It can be made into diverse items such as mats, shoes and coarse cloth[229].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Landscape Uses:Espalier, Screen, Specimen. Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions according to one report[200], whilst another says that it is tolerant of exposure[125]. Succeeds in full sun or semi-shade[188]. Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. This species flourishes in Britain[11, 125]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. Unlike most other members of this genus, this species does not usually become infested with aphid[125]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 4.2.74 Quercus macrocarpa

Burr Oak, Mossy Cup Oak  
 3 tin 8 cyuc 3 kcaak 4 tcan 2 dwat m hkuc  
 hmimhtut cyutli hgatkuyctup hwicli jlytnyikfrip hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Quercus macrocarpa* is a deciduous Tree growing to 15 m (49ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[101, 105, 161, 257]. Very large, the seed can be up to 5cm x 4cm[82, 200], though it is somewhat variable in size and shape[227]. The seed can be ground into a powder and used in making bread, dumplings etc and as a thickener in soups[183]. The seed of this species is considered to be one of the most palatable of all the oaks[159, 183]. Many trees have sweet seeds with little tannin and the seed can be eaten raw or cooked. If the seed is bitter then this is due to the presence of tannins, these can be leached out by thoroughly washing the dried and ground up seed in water, though many minerals will also be lost. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would



grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kaakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[226]. Somewhat sweet[229]. The seed is about 1 - 3cm long[200] and ripens in its first year[235]. It contains about 6% protein and 65% carbohydrates[213]. It is low in tannin and needs little if any leaching. It is said that those seeds with red or pink blotches on the shell are the sweetest[183]. Any bitter tannins can be leached out by thoroughly washing the dried and ground up seed in water, though many minerals will also be lost. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The seed can be roasted and then eaten, its taste is something like a cross between sunflower seeds and popcorn[183]. The roasted seed is a coffee substitute that is free from caffeine[226].

tcanta Fuel Repellent Tannin WoodAgroforestry Uses: White oak is potentially valuable for use in reforestation projects, and appears to have potential for use on other types of disturbed sites. It has been planted on strip-mined lands in Ohio, Indiana, and Illinois, and has exhibited good growth and survival on cast overburden and graded topsoil overlying mine spoils. It is well adapted to loamy and clayey spoils with a pH of 5.5 to 8.0[1050] Other Uses: The leaves of most species in this genus are more or less rich in tannins. A mulch of the leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc. Fresh leaves should be used with caution, since these can utilize some of the nitrogen in the soil and thus inhibit plant growth[20, K]. The bark is a rich source of tannin[171, 226]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A brown dye is obtained from the bark or from the galls, it does not require a mordant[226]. Yellow, chrome and gold can also be obtained if mordants are used[226]. The wood is strong, very heavy, hard, tough, strong, close grained, durable[46, 82, 171, 213, 227]. It weighs about 46lb per cubic foot[227]. When properly dried treated, the wood glues well, machines very well and accepts a variety of finishes One of the most important timbers in N. America, it is used for cabinet making, furniture, panelling, flooring, construction, mine props, agricultural tools etc[46, 82, 171, 213, 1050]. It is highly valued for making the staves of barrels for storing wine and liquor[274, 338]. The wood is a good fuel giving off a lot of heat[46, 1050]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiseptic Astringent Dysentery TonicWhite oak was often used medicinally by several native North American Indian tribes, who valued it especially for its antiseptic and astringent properties and used it in the treatment of many complaints[257]. It is little, if at all, used in modern herbalism. The inner bark contains 6 - 11% tannin, it has powerful antiseptic and astringent properties and is also expectorant and tonic[61, 102, 213, 257]. The bark is boiled and the liquid drunk in the treatment of bleeding piles and diarrhoea, intermittent fevers, coughs and colds, consumption, asthma, lost voice etc[213, 257]. The bark has been chewed as a treatment for mouth sores[257]. Externally, it is used as a wash for skin eruptions, burns, rashes, bruises, ulcers etc and as a vaginal douche[222, 257]. It has also been used as a wash for muscular pains[257]. The bark is best collected in the spring[213]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in

situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. The white oak prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage over the winter[200]. There are, however, a number of trees 20 metres tall in Britain, mainly in the south-east of the country[11]. Sometimes cultivated for its edible seed, there are some named varieties[183]. Trees take about 30 years before they start to bear good crops of seed, they then have heavy crops about every 3 years with light crops in the other years[227]. They continue to yield commercial crops for about 120 years[227]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young, though they may require protection for the first winter or two[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.72 Celtis occidentalis

Hackberry, Common hackberry

3 tin 9 cyuc 3 kcaak 2 tcan 1 dwat 20 m hkuc htut cyutli hgatkuyctup hwicli hyshrasjtup hpa7ti flatprklwis hpa7tmwatli xre7t hjonli

drutta Celtis occidentalis is a deciduous Tree growing to 20 m (65ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw[2, 3, 55, 149]. Very sweet and pleasant tasting, they can be eaten out of hand or can be used for making jellies, preserves etc[183]. The fruit is often produced abundantly in Britain, it is about the size of a blackcurrant, but there is very little flesh surrounding a large seed and it is therefore a very fiddly crop[K]. The fruit is dark orange to purple- or blue-black when fully ripe, usually about 7-11mm in diameter, though occasionally up to 20mm[270]. The flesh is dry and mealy but with a pleasant sweet taste[K]. Seed[57]. No more details. The fruit and seed can be ground up finely together and used as a flavouring[161, 183]. The N. American Indians ate them with parched corn[183].

tcanta Dye Fuel Miscellany Shelterbelt WoodA dye is obtained from the roots[61]. No more details are given. Fairly wind-tolerant, it can be planted as part of a shelterbelt[200]. Wood - rather soft, weak, coarse-grained, heavy. It weighs 45lb per cubic foot and is sometimes used commercially for cheap furniture, veneer, fencing fuel etc[46, 61, 82, 171, 227].

the plants with a layer of straw and an upturned bucket. This species is probably of hybrid origin, *R. raphaniticum* x *R. palmatum*[200]. It hybridizes freely with other members of the genus[200]. Plants in this genus seem to be immune to the predations of rabbits[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 4.2.36 Prunus besseyi

Western Sand Cherry

3 tin 6 cyuc 4 kcaak 2 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli hgattcup hwicli hrasjtutnyik hpa7ti flatprklwis hpa7tmwatli xre7t hjonli

drutta *Prunus besseyi* is a deciduous Shrub growing to 1.2 m (4ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[85, 183, 257]. A sweetish flavour, the fruit can also be dried for later use[183]. It makes a rather astringent but tasty jelly[182]. The fruit is a reasonable size, up to 18mm in diameter, and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye RootstockA green dye can be obtained from the leaves[183]. A dark grey to green dye can be obtained from the fruit[168]. The plant can be used as a rootstock for plums[160]. It produces mostly dwarf trees that are poorly anchored[183]. Prone to severe suckering[183]. Compatible with most prunes, it is incompatible with damsons and Victoria plums[183]. Resistant to "Crown Gall"[183]. Trees on this rootstock are productive and very cold hardy[183]. Cuttings are often easy to root but seedlings vary widely[183].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Division of suckers in the dormant season. They can be planted out direct into their permanent positions. Layering in spring.

nwatta Landscape Uses:Specimen. Thrives in a well-drained moisture-retentive loamy soil, doing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Established plants are drought resistant[160]. A very hardy plant, probably tolerating temperatures down to about -50°C when it is fully dormant[160]. It is cultivated for its edible fruit in warmer climates than Britain[11], there are some named varieties[183]. It flowers very well in this country but does not usually produce much fruit[11]. Another report says that it sometimes fruits abundantly in Britain. The cultivar "Black Beauty" crops well and has small black sweet fruits[200]. "Hansens" has large fruits with a good flavour[200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants are inclined to sucker and can produce dense thickets[160]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Attracts

birds, North American native, All or parts of this plant are poisonous, Fragrant flowers, Blooms are very showy.

## 4.2.37 Camassia leichtlinii

Wild Hyacinth, Large camas, Suckdorsf's large camas  
3 tin 7 cyuc 4 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjtutnyikfrp hpa7ti flatprklwis hpa7tmwatli xre7t hjonli

drutta *Camassia leichtlinii* is a BULB growing to 1 m (3ft 3in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf from March to August, in flower from June to July, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kaakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[94, 105, 177]. The bulb is about 3cm in diameter[270], eaten raw it has a mild, starchy flavour, but a gummy texture that reduces the enjoyment of it somewhat[K]. It is excellent when slow baked, however, developing a sweet flavour and making a very good potato substitute[183, 256, K]. The cooked bulb can also be dried for later use[183] or ground into a powder and used as a thickener in soups or as an additive to cereal flours when making bread, cakes etc[161]. The bulbs can be boiled down to make a molasses, this was used on festival occasions by various Indian tribes[183]. One report says that the bulbs contain inulin (a starch that cannot be digested by humans) but that this breaks down when the bulb is cooked slowly to form the sugar fructose which is sweet and easily digested[256].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[134]. The seed can also be sown in a cold frame in spring[134]. It usually germinates in 1 - 6 months at 15°C, but it can be erratic[138]. Sow the seed thinly so that it does not need to be thinned and allow the seedlings to grow on undisturbed for their first year. Give an occasional liquid feed to ensure that the plants do not become nutrient deficient. When the plants are dormant in late summer, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on for another one or two years in a cold frame before planting them out when dormant in late summer. Offsets in late summer. The bulb has to be scored in order to produce offsets.

nwatta A very easily grown plant, it succeeds in almost any soil[42] and is tolerant of considerable neglect once it is established[K]. Grows well in heavy clay soils. Prefers a rather heavy loam[1] that has plenty of moisture in spring but does not remain wet over the winter[138, 200]. Dislikes dry soils[200]. Prefers full sun but tolerates partial shade[138, 200]. A very ornamental plant[1], there are many named varieties[200]. Plants often self-sow[K]. A good bee plant[108]. Plants can be naturalized in damp grass, this should not be trimmed until mid to late summer when the bulbs have flowered and the leaves have died down[134]. This species can be confused with certain poisonous bulbs in the genus *Zigadenus*[85]. Plant the bulbs 7 - 10cm deep in early autumn and then leave undisturbed[1]. The bulbs should be planted about 20cm deep[233]. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is a bulb.

## 4.2.38 *Amaranthus hypochondriacus*

Prince's Feather, Prince-of-wales feather

3 tlin 10 cyuc 4 kcaak 2 can 3 dwat 1.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli fyif hjonli

drutta *Amaranthus hypochondriacus* is a ANNUAL/PERENNIAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in leaf from April to October, in flower from July to August, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: ColouringYoung leaves - cooked as a spinach[183, 238]. Rich in vitamins and minerals, they have a mild flavour[K]. Seed - raw or cooked. They can be used as a cereal substitute. They can also be popped in much the same way as popcorn[183]. The seed can be soaked for 12 hours in warm water and then allowed to sprout for about 11 days[244]. They can then be added to salads[183]. Very small but the seed is easy to harvest and very nutritious. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K]. A red pigment obtained from the plant is used as a food colouring[238].

tcanta DyeYellow and green dyes can be obtained from the whole plant[168]. A red dye obtained from the plant (the report does not specify which part of the plant) is used as a colouring in foods and medicines[238].

dwatta Antidiarrhoeal AstringentThe whole plant contains tannin and is astringent[238, 254]. It is used internally in the treatment of diarrhoea and excessive menstruation[238, 254]. It can be used as a gargle to soothe inflammation of the pharynx and to hasten the healing of ulcerated mouths[254], whilst it can also be applied externally to treat vaginal discharges, nosebleeds and wounds[238]. The plant can be used fresh or it can also be harvested when coming into flower and dried for later use[238].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Tolerates a pH in the range 5.2 to 7.5. Plants should not be given inorganic fertilizers, see notes above on toxicity. Often cultivated, especially in tropical areas, for its edible leaves and seeds, there are many named varieties[183]. This is the most robust and highest yielding of the grain amaranths, though it is late maturing and therefore less suitable for northern areas[183]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 4.2.39 *Rhus aromatica*

Lemon Sumach, Fragrant sumac

3 tlin 9 cyuc 4 kcaak 2 can 2 dwat 1.2 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta *Rhus aromatica* is a deciduous Shrub growing to 1.2 m (4ft) by 1.5 m (5ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost

tender. It is in flower in April, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit - raw or cooked[2, 22]. The fruit is small with very little flesh, but it is easily harvested and when soaked for 10 - 30 minutes in hot or cold water makes a very refreshing lemonade-like drink (without any fizz of course)[61, 85, 183, K]. The mixture should not be boiled since this will release tannic acids and make the drink astringent. The fruit can also be dried and ground into a powder then mixed with corn meal and used in cakes, porridges etc[183].

tcanta Basketry Dye Mordant Oil Soil stabilization TanninThe leaves are rich in tannin (up to 25%) and can be collected as they fall in the autumn then used as a brown dye or as a mordant[169]. The bark is also a good source of tannin[4]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The plant has an extensive root system and is sometimes planted to prevent soil erosion[200]. The split stems are used in basket making[4, 46, 61].

dwatta Astringent Diuretic DysenteryThe leaves are astringent and diuretic[61, 222]. They were used in the treatment of colds, stomach aches and bleeding[222]. The root bark is astringent and diuretic[4, 222]. An infusion can be used in the treatment of diarrhoea, dysentery. Used externally, it is used to treat excessive vaginal discharge and skin eruptions and also as a gargle for sore throats[254]. Its use is contraindicated if inflammation is present[222]. The root is harvested in the autumn and dried for later use[254]. The fruits are astringent and diuretic[254]. They have been chewed in the treatment of stomach aches, toothaches and gripes[222] and used as a gargle to treat mouth and throat complaints[254]. They help reduce fevers and may be of help in treating late-onset diabetes[254]. Some caution is advised in the use of the leaves and stems of this plant, see the notes above on toxicity.

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Landscape Uses:Border, Erosion control, Foundation, Ground cover, Massing, Seashore, Woodland garden. Succeeds in a well-drained fertile soil in full sun[11, 200]. Tolerates poor soils[169, 200]. Established plants are drought resistant[169]. A very hardy plant when fully dormant, tolerating temperatures down to about -25°C[184]. However, the young growth in spring can be damaged by late frosts. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. This species is a low suckering shrub[182]. There is a specially low growing form, var. *arenaria*, that is found growing on sand dunes in the mid-west of N. America[184]. A polymorphic species[43]. Plants are susceptible to coral spot fungus[11]. Plants have brittle branches that are easily damaged in very strong winds[11]. Plants in this genus are notably resistant

mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SapEdible Uses: SweetenerSap - raw or cooked[2]. A sweet flavour[177]. Harvested in early spring, before the leaves unfurl. The trunk is tapped by drilling a hole about 6mm wide and about 4cm deep. The sap flows best on warm sunny days following a hard frost. It makes a refreshing drink[55, 95] and can also be concentrated into a syrup or sugar[183]. The sap can be fermented to make birch beer or vinegar[183]. An old English recipe for the beer is as follows: "To every Gallon of Birch-water put a quart of Honey, well stirr'd together; then boil it almost an hour with a few Cloves, and a little Limon-peel, keeping it well scumm'd. When it is sufficiently boil'd, and become cold, add to it three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it up. . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk ante pastum."[269].

tcanta Besom Soil stabilization WoodYoung branches are used to make besoms, whisks etc[6]. This species has an extensive root system and is sometimes planted for erosion control along the banks of streams[227]. Wood - light, strong, close grained and hard, but it contains many knots because of the numerous branches along the trunk. It weighs 36lb per cubic foot. Of little use commercially, though it is sometimes used for furniture, turnery etc[46, 61, 82, 227, 229].

dwatta Antiseborrheic Diuretic Dysentery Salve Stomachic UrinaryA salve was made by boiling the buds until they were thick and pasty, sulphur was added and this was then applied externally to skin sores and ringworm[213]. The leaves have been chewed, or used as an infusion, in the treatment of dysentery[257]. An infusion of the bark has been used to treat stomach problems, 'milky' urine and difficult urination with discharge[257]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen, Woodland garden. Succeeds in a well-drained loamy soil in a sheltered position[11, 43, 200]. Grows well in heavy clay soils. Likes its roots within reach of water[11]. Dislikes wet soils according to another report[200]. Shade tolerant[200]. Hybridizes freely with other members of this genus[50]. A good plant to grow near the compost heap, aiding the fermentation process[20]. Trees are notably susceptible to honey fungus[200]. Special Features: Attracts birds, North American native, Attracts butterflies, Inconspicuous flowers or blooms.

## 4.2.70 *Aronia melanocarpa*

Black Chokeberry, Black Berried Aronia

3 tlin 8 cyuc 3 kcaak 2 can 1 dwat m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Aronia melanocarpa* is a deciduous Shrub growing to 2.5 m (8ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light

(sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Pectin PectinFruit - cooked. A good flavour but very astringent[183]. The fruit should be fully ripe before being eaten and is best after a frost or two[K]. It makes a good jelly when sugar is added and is also dried and used for making pemmican[183]. The fruit is rich in pectin and can be added to fruits that are low in this substance when making jams etc[183]. Pectin is also said to protect the body against radiation[201]. The fruit is about 9mm in diameter[200].

tcanta Miscellany Pectin PectinThe fruit is a source of pectin[183], a substance that is used to thicken jams etc and as a culture medium in laboratories.

dwatta MiscellanyAn infusion of the berries has been used in the treatment of colds[257].

propta Seed - best sown as soon as it is ripe in pots outdoors or in a cold frame[113]. Pre-soak stored seed overnight and then cold stratify for 3 months at 2°C[113]. The seed germinates in 1 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring. Cuttings of half-ripe wood, July/August in a frame[113]. Division of suckers in the dormant season[200]. Very easy, they can be planted straight out into their permanent positions. Layering[200].

nwatta Landscape Uses:Screen, Specimen. Prefers a moist peaty soil in full sun or partial shade[200]. Succeeds in most soils but dislikes shallow chalk[200]. More tolerant of dry soils than other members of this genus[200]. Plants are hardy to about -25°C. There is at least one cultivar developed for its improved fruit. 'Nero' has fruits twice the size of the species with a vitamin C content of 15 - 30 mg (per 100g?). The fruit is borne in clusters of about 15, it is more flavourful and the yield is about twice that of wild forms[183]. Other cultivars developed mainly for their ornamental value include 'Viking' with extra large berries and 'Aron' with numerous large berries[182]. The sub-species *A. melanocarpa elata* Rehd. and *A. melanocarpa grandifolia* (Lindl.)Schneid. are more vigorous than the type species with larger flowers and fruits[200]. This genus is closely related to *Sorbus* species[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Naturalizing, Wetlands plant, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.71 *Quercus alba*

White Oak, Hybrid oak

3 tlin 9 cyuc 3 kcaak 4 tcan 2 dwat 20 m hkuc  
hmimhtut cyutli kyuctcup hwicli jlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Quercus alba* is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

hmmihtut cyutli tcup hwicli hrasljutnykfrip hpa7tli flatprklwis hpa7tmwatli nyanhjen hjonli

drutta Acer negundo is a deciduous Tree growing to 21 m (69ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from April to May, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark Leaves Sap SeedEdible Uses: SweetenerThe sap contains a reasonable quantity of sugar and can be used as a refreshing drink or be concentrated into a syrup[11, 46, 61, 82, 159]. The syrup is used as a sweetener on many foods. The sugar content is inferior to A. saccharum according to one report[149] whilst another says that it is highly valued as a producer of sweet sap[183]. The sugar from the sap of this tree is said to be whiter than that from other maples[183]. To obtain the sap, bore a hole on the sunny side of the trunk into the sapwood about 1 metre above the ground at anytime from about January 1st until the leaves appear[85]. The flow is best on a warm day after a frost[213]. The best sap production comes from cold-winter areas with continental climates. Inner bark - raw or cooked. It can be dried, ground into a powder and then used as a thickener in soups etc or be added to cereal flours when making bread, cakes etc[257]. The inner bark can also be boiled until the sugar crystallizes out of it[257]. Self-sown seedlings, gathered in early spring, are eaten fresh or dried for later use[213]. Seeds - cooked. The wings are removed and the seeds boiled then eaten hot[213]. The seed is up to 12mm long and is produced in small clusters[82].

tcanta Musical Preservative Shelterbelt WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. A fairly wind-tolerant tree, it can be used in mixed plantings as a part of shelterbelt plantings[200]. Wood - soft, weak, light, close grained. It weighs 27lb per cubic foot[235]. Of little commercial value, it is used for boxes, cheap furniture, pulp, fuel etc[46, 61, 82, 149, 229]. Large trunk burls or knots have been used to make drums[257].

dwatta EmeticA tea made from the inner bark is used as an emetic[222, 257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them out until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. The cuttings of this species usually root easily. Budding onto A. negundo in early summer usually works well. The bud should develop a small shoot in the summer otherwise it is unlikely to survive the winter.

nwatta Of easy cultivation, succeeding in most soils[202] but preferring a rich moist well-drained soil and a sunny position[11]. Grows well in heavy clay soils and in sandy soils[188]. Plants often become chlorotic on very alkaline soils[202]. Plants are hardy to about -18°C[202]. A fast growing but short-lived tree in the wild, living for 75 - 100 years[149, 229]. It is fairly wind-tolerant[200], but the branches have a tendency to break in strong winds[226]. This species is cultivated commercially in Illinois for its sap[183]. Another report says that this is one of the least productive species for sugar[226]. A very ornamental plant[1,

there are several named varieties[200]. This tree is a bad companion plant that is said to inhibit the growth of neighbouring plants[18, 20]. This species is notably resistant to honey fungus[88, 200]. Very tolerant of pruning, it can regenerate from old wood if it is cut back hard[202]. Dioecious. Male and female plants must be grown if seed is required.

## 4.2.68 Mertensia maritima

Oyster Plant

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat m hkuc htut cyutli kyuctcup hwicli hyishrasljut hpa7tli flatprklwis hpa7tmwatli fyifxre7t hjonli

drutta Mertensia maritima is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects? Self. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves - raw or cooked[172, 183]. They are said to taste of oysters[5]. No-one has yet noticed a resemblance to oysters though not many of the tasters have ever eaten oysters! The flavour is fairly bland, the leaf is thick and has a very mucilaginous texture - it is probably this texture that reminds people of oysters[K]. Root[22, 46, 61, 105]. Eaten by the Inuit of Alaska[183, 257]. Flowers - raw[172].

tcanta None known

dwatta None known

propta Seed - sow as soon as it is ripe in a cold frame. Spring sown seed is also successful[K]. Germination usually takes place within a month. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in April or early September. With care since the plant resents root disturbance.

nwatta Thrives in nutritionally poor sandy or gravelly soils in a sunny position[200]. Requires a very well-drained soil[188]. Dislikes shade[233]. Plants are resentful of root disturbance and should be planted out into their permanent positions as soon as possible[200]. This species is not very easy to cultivate[1]. Plants are very susceptible to slug damage[188, K] The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.69 Betula nigra

River Birch, Black Birch, Red Birch, Water Birch, River Birch 3 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 20 m hkuc hhmihhtut cyutli tcup hwicli hrasljutnykfrip hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Betula nigra is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in March, and the seeds ripen in June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH:

to honey fungus[200]. This species transplants easily[169]. The plant has an offensive smell[149]. Or, to go by another nose, the bruised leaves emit a delicious resinous scent[245]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Attracts birds, North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.40 Helianthus pauciflorus

Stiff Sunflower, Prairie Sunflower

3 tlin 7 cyuc 4 kcaak 1 tcan 0 dwat 1.5 m hkuc

htut cyutli hgatkuyctcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Helianthus pauciflorus is a PERENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Oil SeedEdible Uses: OilCarbon Farming Solutions - Staple Crop: protein-oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. Perennial crops are being developed for their oil-seed. The Land Institute see them as part of a perennial polyculture system [1-1].

tcanta OilDrought-tolerant and suitable for xeriscaping.

Attractive to bees, butterflies and/or birds

dwatta None Known

propta An easy plant to grow. Division. Herbaceous stem cuttings. Seed; direct sow outdoors in autumn. Self-sows freely.

nwatta Management: Standard Staple Crop: Protein-oil Under DevelopmentClimate: boreal to warm temperate. Humidity: semi-arid to humid. Soil pH: 6.1 (mildly acidic) to 7.8 (mildly alkaline). Prefers full sun and mesic to dry conditions. Soil can contain significant amounts of loam, clay loam, sand, or gravelly material. Easy to grow. Carbon Farming Solutions - Cultivation: under development. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1]. Perennial crops are being developed for their oil-seed. The Land Institute see them as part of a perennial polyculture system [1-1]. Several perennial sunflowers are being worked with including prairie natives handling boreal to warm temperate semi-arid conditions: Helianthus maximiliani (Maximilian sunflower), Helianthus tuberosus (Jerusalem artichoke), Helianthus pauciflorus (Stiff sunflower). Less tolerant of boreal conditions but good on poor soils is Helianthus cusickii (Cusick's sunflower) [1-1].

## 4.2.41 Secale cereale

Rye, Cereal rye

3 tlin 7 cyuc 4 kcaak 3 tcan 1 dwat 1.8 m hkuc

htut cyutli hgattcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Secale cereale is a ANNUAL growing to 1.8 m (6ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower

from May to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: Coffee Oil SweetenerSeed - cooked[2, 13, 34, 46]. A common cereal, it is used especially in N. Europe to make bread[183]. The seed contains about 13% protein[61]. The grain also contains some gluten, though not as much as wheat, so it makes a heavier bread than wheat. It can also be used to make cakes etc. The seed can be sprouted and added to salads[183]. A nutritional analysis is available[218]. Malt, a sweet substance produced by germinating the seed, is extracted from the roasted germinated seed and used as a sweetening agent and in making beer etc[13]. The roasted (ungerminated) seed is used as a coffee substitute[46, 183].

tcanta Biomass Green manure Oil Soil stabilization ThatchingThe straw is used as a fuel or as a biomass in industry[141]. It is quite strong[100] and can also be used in thatching, for paper making, weaving mats and hats etc[13, 34, 46, 61, 171]. Other uses for the straw include as a packing material for nursery stock, bricks and tiles, for bedding, archery targets, and mushroom compost[269]. The plant is a good green manure crop. It is fast growing with an extensive and deep root system[46]. It is especially useful if sown in late autumn. Its growth over the winter will prevent soil erosion and the leaching of nutrients from the soil, it can then be incorporated into the soil in the spring[171]. The extensive root system also makes this a good plant to use for soil stabilization, especially on sandy soils[171].

dwatta Cancer Laxative PoulticeThe seed is made into a poultice and applied to tumours[218]. The seed is also an effective laxative due to its fibrous seed coat[269].

propta Seed - sow March or October in situ and only just cover the seed. Germination should take place within 2 weeks.

nwatta An easily grown plant, it succeeds in most soils but prefers a well-drained light soil in a sunny position[1, 132]. It thrives on infertile, submarginal areas and is renowned for its ability to grow on sandy soils[269]. Established plants are drought tolerant[1]. The plant is reported to tolerate an annual precipitation in the range of 22 to 176cm, an annual temperature in the range of 4.3 to 21.3°C and a pH of 4.5 to 8.2[269]. Rye is a widely cultivated temperate zone cereal crop. It is able to withstand severe climatic conditions and can be grown much further north and at higher altitudes than wheat[13, 34, 57]. Average yields vary widely from country to country, the world average is around 1.6 tonnes per hectare with yields of almost 7 tonnes per hectare achieved in Norway[269]. There are many named varieties[183]. Rye is a rather variable species and botanists have divided it into a number of sub-species, all of which could be of value in breeding programmes. These sub-species are briefly listed below:- S. cereale afghanicum (Vavilov);K.Hammer: Native to the Caucasus, western Asia and India. S. cereale ancestrale Zhuk. Native to western Asia. S. cereale dighoricum Vavilov. Native to the Caucasus and eastern Europe. S. cereale segetale Zhuk. Native to temperate Asia. Rye grows well with cornflowers and pansies[18, 20], though it inhibits the growth of poppies and couch grass[18, 20]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

## 4.2.42 Campanula persicifolia

Harebell, Peachleaf bellflower

3 tlin 7 cyuc 4 kcaak 0 tcan 0 dwat 1 m hkuc

hmmihtut cyutli tcup hwicli hrasljut hpa7tli prklwis hpa7tmwatli fyifxre7t hjonli

drutta *Campanula persicifolia* is an evergreen Perennial growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Root**Edible Uses:** Leaves - raw or cooked[2, 105]. Rich in vitamin C[74]. A mild flavour; it is nice in salads and is liked by most people who try it[K]. The plant forms over-wintering basal rosettes of leaves and thus provides a source of fresh leaves throughout the winter[K]. The main problem with these leaves is that they are very narrow and it takes quite a lot of picking in order to obtain a reasonable quantity[K]. Root - raw[74]. Flowers - raw. A pleasant sweetness, and a very ornamental addition to mixed salads[K].

tcanta None known

dwatta Vitamin CNone known

**propta Seed** - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in ordinary garden soil[187]. Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Succeeds in light woodland[200]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. A very ornamental plant, there are many named varieties[187]. It was at one time grown as a culinary vegetable, but is now only grown as an ornamental plant[4]. The sub-species *C. persicifolia* crystallocalyx has larger leaves than the species and so is more suitable as a food crop[K]. A very long-lived and easily grown plant[187], it is best divided every other year[111]. Slugs are very fond of this plant and can cause severe damage even to large plants[K]. Members of this genus are rarely if ever troubled by browsing deer[233]. This plant is a potential winter salad plant, it retains a basal rosette of leaves all winter[K].

### 4.2.43 *Rheum × hybridum*

Garden Rhubarb

3 tlin 8 cyuc 4 kcak 1 tcan 3 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwisi hpa7tmwatli hjonli

drutta *Rheum × hybridum* is a deciduous Perennial growing to 1.5 m (5ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

**kcakta Leaf stem** - raw or cooked[1, 2, 46, 105, 200]. An acid taste, it is used as a fruit substitute in spring, usually stewed with sugar and used in pies, jams etc[183]. The juice strained from stewed rhubarb can add colour and flavour to a fruit punch[183]. It is best not to eat large quantities of the stems because of their oxalic acid content - see the notes above on toxicity. Immature flowers - cooked and used like cauliflower[183]. One report says that the plant contains

0.7% rutin[240]. It does not specify which part of the plant, though it is likely to be the leaves[K].

tcanta The leaves can be simmered in hot water to make an insecticide.

dwatta Rhubarb has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[238]. The main species used is *R. palmatum*. Though the chemistry varies slightly, this species is used interchangeably[238]. Another report says that this species contains only small quantities of the medicinally active compounds and so it is only used as a mild laxative[244]. The root is anticholesterolemic, antispasmodic, antitumor, aperient, astringent, cholagogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 37, 57, 61, 171, 238]. Small doses act as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

**propta Seed** - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. This species is a hybrid and will not necessarily breed true to type from seed. However, this does give the opportunity to look for superior plants from amongst the seedlings. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta *R. hybridum* is an herbaceous perennial plant. A very easily grown plant, tolerant of considerable neglect, it prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200, 264]. It succeeds in most soils provided the drainage is good[200] and will grow in the dappled shade of trees so long as there is sufficient side light[K]. It grows well in heavy clay soils. Tolerates acid conditions but prefers a pH in the range 6.5 to 7[200]. Plants are very cold hardy, tolerating temperatures down to at least -20°C[200]. The plant does not like hot summers, however, and is likely to die in warmer climates[264]. Rhubarb is a long-lived and almost indestructible perennial plant[264]. It is often cultivated for its edible leaf stems, there are many named varieties[74, 183]. Most cultivars produce edible stems from spring to early summer, though 'Glaskin's Perpetual' can be harvested throughout the summer. By digging up the roots in the autumn and exposing them to frost, earlier growth will be initiated. These roots can then be transferred to a cold frame or other protected area where they will produce their edible stems in late winter. It is also possible to produce earlier crops outdoors by covering the plants with a layer of straw and an upturned bucket. This species is probably of hybrid origin, *R. rhaiponticum* x *R. palmatum*[200]. It hybridizes freely with other members of the genus[200]. Plants in this genus seem to be immune to the predations of rabbits[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 4.2.44 *Brassica oleracea botrytis*

Cauliflower

3 tlin 10 cyuc 4 kcak 3 tcan 0 dwat 0.8 m hkuc

of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers a hotter summer than is usually experienced in Britain[200], but trees still grow well in Britain[11, 200]. A fairly fast-growing tree[188], it is cultivated for its timber in C. Europe. Trees normally require 20 - 25 years to reach flowering size, and may take another 20 years before heavy crops of seed are produced[229]. Seed production is cyclic, heavy crops being produced every 2 - 5 years in the wild[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Trees are able to regenerate from root suckers if the top is killed by a forest fire[226]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 4.2.66 *Betula lenta*

Cherry Birch, Sweet birch, Black Birch, Cherry Birch

3 tlin 7 cyuc 3 kcak 4 tcan 3 dwat 24 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli frusflatprikwisi hpa7tmwatli hjonli

drutta *Betula lenta* is a deciduous Tree growing to 24 m (78ft 9in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Inner bark **Sap****Edible Uses:** Condiment Sweetener Tealinner bark - cooked or dried and ground into a powder[4, 62, 102]. Sweet and spicy[177]. The dried inner bark can be used as a thickener in soups etc or can be added to flour when making bread etc. Inner bark is generally only seen as a famine food, used when other forms of starch are not available or are in short supply[K]. Sap - raw or cooked[2, 46, 102]. A sweet flavour[61, 177]. It is harvested in early spring, before the leaves unfurl, by tapping the trunk. The flow is best on sunny days following a heavy frost. A delicious drink, it can also be concentrated into a syrup or sugar[183]. The sap can be fermented to make birch beer or vinegar[183]. An old English recipe for the beer is as follows:- "To every Gallon of Birch-water put a quart of Honey, well stirr'd together; then boil it almost an hour with a few Cloves, and a little Limon-pee, keeping it well scumm'd. When it is sufficiently boil'd, and become cold, add to it three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it up . . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk ante pastum." [269]. The dried leaves and bark from the larger roots are a delightful tea substitute[177, 183]. A wholesome, agreeable tea is made from the essential oil contained in the inner bark and twigs[21, 55, 62]. This essential oil is also used as a winter-green flavouring in foods[183].

tcanta **Essential Fuel** Tannin **Wood**An essential oil is obtained from the bark and twigs, it is distilled in quantity and is an item of commerce[235]. It can be used medicinally, as a food flavouring, as an ingredient in cosmetic shampoos and also to make a wholesome tea[11, 21, 46, 171, 269]. The oil, when decolourized, is similar to 'Oil of Wintergreen' (obtained from *Gaultheria procumbens*) and is considered to be of superior quality[245]. The tree is coppiced every 5 years and all parts are distilled for the oil[245]. The tree grows up to 3 metres tall in this 5 year period[245]. The greatest yield of oil is obtained if the tree is harvested in the summer[245]. The oil distilled from the wood is insect repellent[269]. The bark contains up to 16% tannin[223]. The thin outer bark

is waterproof and has been used as the outer cladding on dwellings, canoes etc[257]. It has also been used to make baskets, dishes, buckets etc[257]. Wood - very strong, close grained, hard, heavy. The wood is richly marked[4], it weighs 40lb per cubic foot and is exploited commercially for making floors, furniture, tools etc[11, 46, 61, 82, 171, 229]. It makes an excellent fuel[11, 46, 61, 229]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta **Analgesic** **Anthelmintic** **Antiinflammatory** **Antiseborrheic** **Astringent** **Diaphoretic** **Diuretic** **Dysentery** **Rubefacient** **Stimulant** **Urinary**The bark is antelmintic, astringent, diaphoretic, diuretic and stimulant[4, 21]. A tea made from the bark is used in the treatment of fevers, stomach aches and lung ailments[222, 257], it is said to be an excellent tonic in cases of dysentery and to be useful in the treatment of gravel and female obstructions[4]. An essential oil distilled from the bark is anti-inflammatory, analgesic and rubefacient[222]. It is used in the treatment of rheumatism, bladder infections, neuralgia etc[222]. The oil, called 'oil of wintergreen', used to be produced commercially, but it is now manufactured synthetically[222]. A tea made from the twigs is used in the treatment of fevers[222]. The leaves can be chewed or used in an infusion in the treatment of dysentery[257]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

**propta Seed** - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta **Landscape** **Uses:**Specimen, Woodland garden. An easily grown plant, it succeeds in a well-drained loamy soil in a sheltered position[11, 200]. Grows well in heavy clay soils. Dislikes wet soils[200]. Shade tolerant[200]. Cherry birch is said to tolerate an annual precipitation of ca 60 to 150cm, an average annual temperature range of 5 to 12°C, and a pH of 4.5 to 7.5[269]. Hybridizes freely with other members of this genus[50]. The bruides foliage has a strong smell of wintergreen[200]. A good plant to grow near the compost heap, aiding the fermentation process[20]. Trees can be coppiced on a cycle of 5 years or more[245]. Trees are notably susceptible to honey fungus[200]. **Special Features:** Attracts birds, North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

### 4.2.67 *Acer negundo*

Box Elder

3 tlin 8 cyuc 3 kcak 3 tcan 1 dwat 21 m hkuc

fertile seed in areas with cool summers[200]. Grows best in a woodland situation, young plants tolerate a reasonable level of shade[200]. They are highly shade-tolerant according to another report[226]. Trees respond well to coppicing, sending up lots of suckers from the roots[226]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. A good bee plant[61, 159]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.64 Vitis aestivalis argentifolia

Summer Grape  
3 tin 7 cyuc 3 kcaak 0 tcan 0 dwat 25 m hkuc  
hmmihtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis aestivalis argentifolia is a deciduous Climber growing to 25 m (82ft 0in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit Leaves SapEdible Uses: Fruit - raw, cooked in jellies, jams, pies etc or dried for later use[1, 2, 22, 46, 183]. Sweet and agreeably flavoured[2, 183]. The taste is best after a frost[101].The dried fruits are eaten as snacks or used in baked goods[183]. The fruit is about 8mm in diameter[200]. Leaves - cooked[55, 159]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. A sweet watery sap is obtained from the stem[101, 183]. Used as a refreshing drink. Young tendrils - raw or cooked[55, 85, 159].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. The flowers are sweetly scented with the aroma of mignonette[245]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This subspecies has a more northerly and inland range than the type and might therefore be more suitable for fruit production in Britain (particularly the northern provenances). Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.65 Quercus rubra

Red Oak, Northern red oak  
3 tin 7 cyuc 3 kcaak 3 tcan 2 dwat 25 m hkuc  
hmmihtut cyutli kyuctcup hwicli jlyutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus rubra is a deciduous Tree growing to 25 m (82ft) by 18 m (59ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[161, 177, 257]. A staple food for several native North American Indian tribes[257]. Up to 3cm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost[183]. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Dye Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Tannin is obtained from the bark[82, 171]. A reddish-brown dye can be obtained from the bark[257]. Wood - coarse-grained, hard, strong, heavy, not durable[46, 82, 171, 226]. It weighs 41lb per cubic foot[235]. An important lumber source in America, it is highly valued for flooring, furniture, veneer, construction etc[46, 82, 171, 226].

dwatta Antidiarrhoeal Antiseptic Antiviral Astringent Cancer Dysentery Emetic Febrifuge Salve TonicThe bark and inner bark is antiseptic, astringent, emetic, febrifuge and tonic[257]. It is used in the treatment of diarrhoea, chronic dysentery, indigestion, asthma, severe coughs, hoarseness, intermittent fevers, bleeding etc[22, 257]. Externally, it is used as a wash for skin eruptions, rashes, burns etc[222, 257]. The bark can be chewed as a treatment for mouth sores[257]. The bark contains tannins, experimentally these have been shown to be antiviral, antiseptic, anticancer and also carcinogenic[222]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities

hmmihtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfkrx7t hjonli

drutta Brassica oleracea botrytis is a BIENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Imature flowering head - raw or cooked[1, 16, 37, 46]. A mild cabbage-like flavour, they make an excellent cooked vegetable and are also very acceptable in salads[K]. By careful selection of cultivars, it is possible to produce flowering heads all year round[K]. Leaves - cooked[37]. A mild cabbage flavour, they make a good cooked vegetable[K]. Do not overharvest them, however, since this would adversely affect the production of the flowering head[K].

tcanta Companion FungicideAn extract of the seeds inactivates the bacteria that causes black rot[20, 201]. Grows well with celery and other aromatic plants since these seem to deter insect predations[18, 20, 201]. Grows badly with beet, tomatoes, onions and strawberries[20, 201].

dwatta None known

propta Seed - sow in a seedbed outdoors in April to June depending on the cultivar. Plant out into their permanent position when the plants are 5 - 10cm tall. Seed of some cultivars can be sown in late winter in a greenhouse in order to obtain a harvest in early summer. Do not let the seedlings get overcrowded or they will soon become leggy and will not make such good plants. If your seedlings do get leggy, it is possible to plant them rather deeper into the soil - the buried stems will soon form roots and the plant will be better supported.

nwatta Succeeds in full sun in a well-drained moisture-retentive fertile soil with plenty of lime[37, 200, 264]. Cauliflowers, especially the winter and spring maturing types, should not be given a soil that is too rich in nitrogen since this can encourage soft, sappy growth that is more susceptible to winter cold damage[264]. Prefers a heavy soil[16]. Requires a warm sunny position[16]. Prefers a pH in the range 6 to 7[200], though it tolerates a pH in the range 4.3 to 8.3. Succeeds in maritime gardens[200]. Lack of moisture in the growing season can cause the plant to produce small or deformed curds[264]. Summer varieties are not very cold hardy and will be damaged by light frosts, winter cauliflower plants are more hardy and will tolerate temperatures down to about -6°C, though the curds are more sensitive and can suffer damage at about -2°C[200]. This damage can often be prevented by bending over the leaves so that they cover the curd. Cauliflowers are widely grown for their edible immature flower heads (or curd). There are many named varieties and, by careful selection, it is possible to provide a year round supply. The summer and autumn maturing cultivars are annuals, they need to produce a certain number of leaves before curd development will be initiated. The optimum temperature for this is around 17°C, but at temperatures above 20°C the curds will either be of poor quality or not be produced at all[200]. Winter and spring maturing forms are biennial and need exposure to temperatures below 10°C before they will produce curds and once again, this will not happen unless the plant has reached a certain size[200]. Grows well with celery and other aromatic plants since these seem to deter insect predations[18, 20, 201]. Grows badly with beet, tomatoes, onions and strawberries[20, 201].

## 4.2.45 Erythronium americanum

Trout Lily, Dogtooth violet  
3 tin 7 cyuc 4 kcaak 3 tcan 1 dwat 0.2 m hkuc  
hmmi cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium americanum is a BULB growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from March to April, and the seeds ripen from May

to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw[106] or cooked[105, 177]. A crisp, chewy and very pleasant taste[183]. The bulb is up to 25mm long and is buried quite deeply in the soil[4]. Leaves - raw or cooked[105, 177]. Added to salads[183]. Eating the leaves will greatly reduce the vigour of the bulb, so can only be recommended in times of emergency[K]. Flowers, flower buds and flower stems - raw or cooked[183].

tcanta Plants spread freely by means of underground stems and make a delightful ground cover in dappled shade[257]. The plants are only in growth from late winter to late spring so the ground cover effect is ephemeral[K].

dwatta Antiscrophulatic Contraceptive Emetic Emollient PoulticeAll parts of the plant, but especially the bulb and the fresh leaves, are strongly emetic and are not used internally[4]. The fresh leaves are also antiscrophulatic and emollient and are used as an infusion or stimulating poultice applied to swellings, tumours and scrofulous ulcers[4, 106, 254]. The juice from crushed leaves has been applied to wounds that are not healing[257]. A poultice of the crushed bulbs has been applied to swellings and to help remove splinters[257]. The raw plant, excluding the roots, has been used by native North American young girls to prevent conception[257].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2-3 years and then plant them out into their permanent positions when they are dormant in late summer. Division in summer as the leaves die down. This species does not produce offsets[200].

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Nonflowering plants far outnumber flowering ones in most populations because of their extensive stolon production[270]. This species does not flower very freely, increasing mainly by its stoloniferous habit[164]. The flowers only open in warm sun[90]. When established in woodland, this species can spread very freely by means of underground roots[258]. Flowers are produced in 3 - 4 years from seed[164]. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is stoloniferous rooting from a corm swelling at the stem base [1-2].

## 4.2.46 Prunus armeniaca mand-schurica

Manchurian apricot  
3 tin 9 cyuc 4 kcaak 3 tcan 3 dwat m hkuc  
hmmihtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis

hpa7tmwatli fyif hjonli

drutta Prunus armeniaca mandschurica is a deciduous Tree growing to 6 m (19ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Oil SeedEdible Uses: Gum OilEdible Portion: Fruit, Seeds. Fruit - raw, cooked or dried for later use[1, 2, 3, 34]. The best forms are soft and juicy with a delicious rich flavour[K]. Wild trees in the Himalayas yield about 47.5kg of fruit per year[194]. The fruit of the wild form contains about 6.3% sugars, 0.7% protein, 2.5% ash, 2.5% pectin. There is about 10mg vitamin C per 100g of pulp[194]. The fruit is about 5cm in diameter and contains one large seed[200]. Seed - raw or cooked[183]. Bitter seeds should be eaten in strict moderation, but sweet ones can be eaten freely[132]. The bitter seeds can be used as a substitute for bitter almonds in making marzipan etc[4]. An edible gum is obtained from the trunk[64]. The seed contains up to 50% of an edible semi-drying oil[4, 57, 61, 183]. Carbon Farming - Staple Crop: oil.

tcanta Cosmetic Dye Gum Oil WoodAn edible semi-drying oil is obtained from the seed[57]. Used for lighting[194]. The oil has a softening effect on the skin and so it is used in perfumery and cosmetics, and also in pharmaceuticals[4, 61]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - handsome, hard, durable. Agricultural implements etc[146, 194]. Carbon Farming - Industrial Crop: oil. Espalier: tree or other plants that is trained to grow flat against a support (such as a trellis or wall).

dwatta Analgesic Anthelmintic Antiasthmatic Antiinflammatory Antipyretic Antiseptic Antispasmodic Antitussive Astringent Cancer Demulcent Emetic Emollient Expectorant Laxative Ophthalmic Pectoral Sedative Skin Tonic Vitamin C VulneraryApricot fruits contain citric and tartaric acid, carotenoids and flavonoids[283]. They are nutritious, cleansing and mildly laxative[254]. They are a valuable addition to the diet working gently to improve overall health. The salted fruit is antiinflammatory and antiseptic[283]. It is used medicinally in Vietnam in the treatment of respiratory and digestive diseases[283]. Antipyretic, antiseptic, emetic, ophthalmic[194]. The flowers are tonic, promoting fecundity in women[218]. The bark is astringent[254]. The inner bark and/or the root are used for treating poisoning caused by eating bitter almond and apricot seeds (which contain hydrogen cyanide)[218]. Another report says that a decoction of the outer bark is used to neutralize the effects of hydrogen cyanide[238]. The decoction is also used to soothe inflamed and irritated skin conditions[254]. The seed is analgesic, anthelmintic, antiasthmatic, antispasmodic, antitussive, demulcent, emollient, expectorant, pectoral, sedative and vulnerary[176, 218]. It is used in the treatment of asthma, coughs, acute or chronic bronchitis and constipation[176, 279]. The seed contains 'laetrile', a substance that has also been called vitamin B17[218]. This has been claimed to have a positive effect in the treatment of cancer, but there does not at present seem to be much evidence to support this[K]. The pure substance is almost harmless, but on hydrolysis it yields hydrocyanic acid, a very rapidly acting poison - it should thus be treated with caution[218]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Difficult[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Difficult. Layering in spring.

nwatta Industrial Crop: Oil Management: Standard Regional Crop Staple Crop: OilClimate: boreal to warm temperate. Humidity: semi-arid to humid. Landscape

Uses:Specimen. Requires a well-drained moisture retentive fertile soil in a warm sunny position[11, 200]. Succeeds in light shade but fruits better in a sunny position[200]. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but is apt to become chlorotic if too much is present[11]. Prefers a pH in the range 6.5 to 7.5[200]. Dislikes clay soils[37, 61]. Intolerant of saline soils[200]. Trees drop their fruit buds if there is a summer drought[200]. The apricot is widely cultivated for its edible fruit in temperate areas that have long hot summers, there are many named varieties[183, 200]. The tree is perfectly hardy in Britain but it usually flowers very early in the spring and the flowers are then liable to be destroyed by frosts[11]. It really requires a more continental climate (with its clearly defined seasons) than it gets in Britain. However, if given the benefit of a south or west facing wall and some protection from frosts when it is in flower, reasonable crops can usually be produced in southern England[1, 219]. The plants are self-fertile[200], but hand pollination would be advisable since they are normally flowering before many pollinating insects are active. In Britain apricots are usually grown on plum rootstocks, 'St. Julien A' is the most widely used[200]. The dwarfing rootstock 'Pixie' is also a possibility, but this must be double worked with 'St. Julien A' because it is incompatible with apricots[200]. Any pruning should be carried out in the summer to allow rapid healing and therefore less risk of infection[201]. Oats should not be grown near apricots because their roots have an antagonistic effect on the roots of the apricot[201]. Tomatoes and potatoes are also bad companions for apricots[201]. If nasturtiums (*Tropaeolum* spp) are grown under apricots they will make the fruit less palatable to insects, though this is not detectable by the human palate[201]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Edible, Not North American native, Fragrant flowers, Attractive flowers or blooms. Carbon Farming - Cultivation: regional crop only. Management: standard. Espalier.

## 4.2.47 Streptopus roseus

Scootberry, Rosybell

3 tlin 7 cyuc 4 kcaak 0 tcan 2 dwat 0.5 m hkuc pcmhmm cydti tcup hwicli hrasjut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Streptopus roseus is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Young leaves and shoots are added to salads to impart a cucumber flavour[183]. They can also be cooked and used as greens[172, 257]. Fruit - raw or cooked. A sweetish flavour[207], though it is said to be cathartic if eaten in quantity[183, 207], especially if you have not eaten this fruit before[K]. A watermelon flavour[172]. The fruit is about 12mm in diameter[235].

tcanta None known

dwatta Cathartic Diaphoretic Ophthalmic Pectoral Tonic Women's complaintsThe fruit is cathartic[172, 207]. An infusion of the roots has been used in the treatment of a fallen womb[257]. A cough syrup can be made from the root[257]. A poultice of the steeped root has been applied to the eyes in the treatment of sties[257]. The flowers are diaphoretic[257]. They can be used to induce sweating in the treatment of colds and fevers. The plant is tonic[257]. An infusion of the plant has been used in the treatment of coughs[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in a cold frame as soon as it is received. The seed, especially if it has been stored, can be very slow to germinate, sometimes taking 18 months or more. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in a shady part of the greenhouse or cold frame. It will normally take 2 or more growing seasons before the roots are large

nwatta Management: Standard Regional Crop Staple Crop: Protein-oilLandscape Uses:Specimen. Requires a deep well-drained loam and a position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. Prefers a sandy soil with a pH around 6 to 7[160]. Dislikes compacted soils or clay sub-soils, otherwise trees grow well on most soils[160]. This is the most cold-resistant of the walnuts[117], tolerating temperatures down to about -35°C in N. America when fully dormant[160]. It is less hardy in Britain, unfortunately, because the wood does not ripen so well here due to our cooler summers. The young growth in spring can be damaged by late frosts[200]. Sometimes cultivated in N. America for its edible seed, there are some named varieties[63, 117, 183]. Trees can come into bearing in 6 - 10 years from seed and fruiting is usually biennial[160]. The trees are quite short-lived, seldom exceeding 80 - 90 years[229]. They require about 105 frost-free days in order to ripen a crop in N. America[160]. Unfortunately, they have not proved successful as a nut tree in Britain, usually failing to produce a crop[11]. This is probably due to our cooler summers[11]. It is sometimes planted as a timber tree in Denmark and Rumania[50]. Plants produce a deep taproot and are intolerant of root disturbance. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first few winters since they are somewhat tender when young[1, 11]. Trees cast a dense shade which reduces the amount of species able to grow below them[201]. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. Plants should only be pruned when they are fully dormant in winter or when they are in leaf, otherwise any cuts will bleed profusely[200]. Hybridizes with *J. ailantifolia*, there are some named varieties of this hybrid that are grown for their edible seed[160]. Special Features:North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.63 Tilia americana

American Basswood, Carolina basswood, Basswood, AmericanBasswood, American Linden

3 tlin 9 cyuc 3 kcaak 3 tcan 3 dwat 25 m hkuc hmimhtj cydti tcup hwicli hrasjutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Tilia americana is a deciduous Tree growing to 25 m (82ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves SapEdible Uses: Chocolate Sweetener TeaYoung leaves - raw or cooked[257]. A mild flavour and a tender but mucilaginous texture, they are very nice in salads[K]. The leaves can be cooked as greens[257]. Sap - obtained from next to

the bark and used as a refreshing drink[105, 161, 177]. It can also be concentrated into a syrup and used as a sweetener[183]. Flowers - raw. They can be added to salads[183]. The flowers are used as a tea substitute. They are sweet and fragrant[183]. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2, 105, 177, 183]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta Fibre Shelterbelt WoodA tough fibre is obtained from the inner bark[46, 227]. The bark is soaked in water then boiled. It is then rubbed on a stick to separate the fibres which can then be used for making thread for sewing, fine yarn for weaving bags, clothing etc and cordage for making nets, shoes, twine, mats etc[189, 226, 227, 257]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - soft, straight grained, light, weak, not durable, easily worked, resistant to splitting, it holds nails badly, holds glue, paint and lacquer well, seasons well but shrinks considerably. It weighs 28lb per cubic foot[227], is odourless and bland-tasting[226]. A commercially important timber in its native range[226, 229]. The white wood is excellent for turning and carving, it is used for making woodenware such as spoons, cheap furniture, pulp etc[46, 82, 171, 227, 229]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antispasmodic Demulcent Diaphoretic Diuretic Dysentery Ophthalmic Poulitice Sedative VermifugeA tea made from the inner bark is applied to burns - it soothes and softens the skin[213]. It is taken internally in the treatment of lung complaints, dysentery, heart burn and weak stomach[222, 257]. The bark is diuretic[257]. An infusion has been taken to promote urination[257]. A decoction of the bark, mixed with cornmeal, has been used as a poultice to draw out boils[222, 257]. A tea made from the fresh or dried flowers is antispasmodic, diaphoretic and sedative[226]. It is used in the treatment of hypertension, hardening of the arteries, digestive complaints associated with anxiety, feverish colds, respiratory catarrh, migraine etc[238]. Lime flowers are said to develop narcotic properties as they age and so they should only be harvested when freshly opened[238]. An infusion of the leaves has been used as an eyewash[257]. A poultice of the leaves has been used in the treatment of burns and scalds, broken bones and swollen areas[257]. A tea or tincture made from the leaves, flowers and buds has traditionally been used for nervous headaches, restlessness and painful digestion[222]. Use with caution, see notes above on toxicity. A decoction of the roots and the bark has been taken in the treatment of internal haemorrhaging[257]. A decoction of the roots has been used as a vermifuge to rid the body of worms[257].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Landscape Uses:Pollard, Screen, Specimen, Street tree. Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soils[200]. Dislikes exposed positions[200]. Another entry in the same book says that it is fairly wind tolerant[200]. Succeeds in full sun or semi-shade[188]. A fast-growing and moderately long-lived tree in the wild, it starts producing seed when about 15 years old and continues for at least another 85 years[229]. It is generally unsatisfactory in Britain, preferring a continental climate and growing more slowly and not usually producing



ther rusting[257]. Wood - rather brittle, close-grained, hard, strong, easily worked but not durable. It weighs 32lb per cubic metre. It has many uses such as veneer, cooperage, furniture, flooring and pulp[11, 46, 82, 227, 235]. Carbon Farming - Industrial Crop: biomass. Agroforestry Services: crop shade. Fodder: bank. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antispasmodic Astringent Dysentery Ophthalmic Skin VDA An infusion of the bark is used in the treatment of coughs, cramps and dysentery[257]. The infusion is also applied externally to old, stubborn running sores[257]. A compound infusion is used in the treatment of 'female complaints'[257]. The inner bark is boiled and used with water as a wash for sore eyes[257]. An infusion is used internally in the treatment of diarrhoea[257]. An infusion of the root bark has been used in the treatment of gonorrhoea[257].

propta Seed - best sown as soon as it is ripe in the spring in a cold frame. It usually germinates immediately and by the end of summer has formed a small tree with several pairs of leaves[82]. Stored seed quickly loses its viability. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Agroforestry Services: Crop shade Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Standard Staple Crop: SugarLandscape Uses:Erosion control, Firewood, Aggressive surface roots possible, Woodland garden. Of easy cultivation, it prefers a good moist well-drained soil[1, 11] but does well in much wetter soils than most member of the genus. Succeeds in most soils including chalk[98]. Another report says that this species is liable to become chlorotic as a result of iron deficiency when it is grown on alkaline soils. Grows well in heavy clay soils. Prefers a moderately sunny position[11, 200]. Tolerates atmospheric pollution[200]. Fairly wind-tolerant[200]. The wood is brittle and branches are liable to break off the tree in high winds[11, 200]. Trees can tolerate short periods of flooding, but are very susceptible to fire[229]. A very ornamental[1] and fast growing tree[11, 98], but it is short-lived[227], seldom surviving longer than 125 - 140 years[229]. The tree has invasive roots and these often interfere with sewer pipes and drainage tiles around houses[226]. The silver maple is a bad companion plant, inhibiting the growth of nearby plants[18, 20]. Special Features:Attracts birds, North American native, Naturalizing. Carbon farming - Cultivation: experimental. Management: standard, coppice. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 4.2.62 Juglans cinerea

Butternut - White Walnut, Butternut  
3 tin 7 cyuc 3 kcaak 3 tcan 3 dwat 25 m hkuc

htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatti fyif hjonli

drutta Juglans cinerea is a deciduous Tree growing to 25 m (82ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Oil Sap SeedEdible Uses: Oil SweetenerSeed - eaten raw or ground into a powder and used with cereal flours in making cakes, biscuits, muffins, bread etc[183]. Oily and sweet tasting with a rich agreeable flavour[11, 62, 63, 101, 183]. The oil in the seed is not very stable and the seed soon becomes rancid once it is opened[82]. The kernel is usually only about 20% by weight of the whole seed[160] and is hard to extract[226]. The unripe fruit can be pickled[183]. The seed is 3 - 6cm in diameter and is produced in clusters of 3 - 5 fruits[82, 229]. An edible oil is obtained from the seed[101, 117, 183], it tends to go rancid quickly. The sweet sap is tapped in spring and can be used as a refreshing drink[101]. It can also be boiled down to a syrup or sugar, or added to maple syrup[82, 101, 117, 159, 183].

tcanta Dye Herbicide Oil WoodA yellow to orange dye is obtained from the seed husks[46, 61, 82] and from the bark[57]. It is dark brown[95, 101]. It does not require a mordant[169]. The seed husks can be dried and stored for later use[169]. A light brown dye is obtained from the young twigs, leaves, buds and unripe fruit[117, 169, 213]. It does not require a mordant[169]. The leaves can also be dried and stored for later use[169]. A black dye is obtained from the young roots[257]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of this species produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200, 201]. Wood - coarse-grained, light, soft, not strong, very attractive[46, 61, 82, 117]. It weighs 25lb per cubic foot[235]. It is not as valuable a crop as the black walnut (J. nigra), but is used indoors for furniture, doors etc[229]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Astringent Cholagogue Dysentery Febrifuge Laxative Odontalgic StomachicButternut was used by various native North American Indian tribes as a laxative and tonic remedy to treat a variety of conditions including rheumatic and arthritic joints, headaches, dysentery, constipation and wounds[254]. In modern herbalism it is considered to be a valuable remedy for chronic constipation, gently encouraging regular bowel movements. It is especially beneficial when combined with a carminative herb such as Angelica archangelica[254]. The quills or inner bark are one of the few potent laxatives that are safe to use in pregnancy [301]. Butternut also lowers cholesterol levels and promotes the clearance of waste products by the liver[254]. An infusion of the inner-bark is used as a cholagogue, febrifuge, mild laxative and stomachic[4, 46, 61, 82, 159, 165, 213, 222]. It is effective in small doses without causing cramps[222]. The bark is best collected in the autumn[213]. Best collected in late spring according to another report[4]. An infusion of the dried outer bark is used in the treatment of toothache and dysentery[226]. The oil from the nuts is used in the treatment of tapeworms and fungal infections[4, 222].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80].

enough to plant out - this is best done when the plant is dormant in the autumn. Division as the plant comes into growth in early spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame for their first year, planting them out in the following spring.

nwatta Requires a cool leafy soil in shade or partial shade[187]. Thrives in a moist light soil containing organic matter[1]. Hardy to at least -20°C. A very ornamental plant[1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.48 Gaultheria procumbens

Checkerberry, Eastern teaberry, Teaberry, Creeping Wintergreen

3 tin 6 cyuc 4 kcaak 4 tcan 3 dwat 0.2 m hkuc  
pcimhmmi cyutli hgatyuctcup hwicli hyishrasljut hpa7tli fruslatfrik hpa7tmwatti fyifxre7t hjonli

drutta Gaultheria procumbens is an evergreen Shrub growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from July to August, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Condiment TeaFruit - raw or cooked[2, 3, 14, 95, 101]. Pleasant but insipid[11]. The fruit is not at all insipid, it has a very strong spicy taste of germolene, just like being in a hospital waiting room[K]. Best after a frost, the fruit hangs onto the plant until spring if it is not eaten by birds etc[62, K]. The fruits can also be used in pies, or made into jams etc[183]. The fruit is up to 15mm in diameter[200]. Young leaves - raw[62, 102, 106]. A pleasant wayside nibble if used when very young[183]. Dry and powdery according to our taste buds[K]. A very agreeable tea is made from the fresh leaves[3, 95, 183]. A stronger tea can be made by first fermenting the bright red leaves[183]. 'Oil of wintergreen' can be distilled from this plant. It is used to flavour beer, sweets, chewing gum etc[183].

tcanta EssentialAn essential oil is obtained from the leaves by steam distillation[2, 14, 57, 213]. In order to obtain the oil, the leaves need to be steeped for 12 - 24 hours in water[4]. The essential oil is used as a food flavouring, medicinally (the original source of Wintergreen oil used as a liniment for aching muscles) and in perfumery and toothpastes. In large doses it can be toxic[165, 244]. A good ground-cover plant for shady positions though it requires weeding for the first year or so[28, 31, 197]. Forming a dense tuft-like carpet, it roots as it spreads and should be spaced about 45cm apart each way[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Analgesic Antinflammatory Antirheumatic Aromatic Astringent Carminative Diuretic Emmenagogue Stimulant TonicCheckerberry leaves were widely used by the native North American Indians in the treatment of aches and pains and to help breathing whilst hunting or carrying heavy loads[238]. An essential oil (known as 'oil of wintergreen') obtained from the leaves contains methyl salicylate, which is closely related to aspirin and is an effective anti-inflammatory[213]. This species was at one time a major source of methyl salicylate, though this is now mainly synthesized[238]. The leaves, and the oil, are analgesic, anti-inflammatory, aromatic, astringent, carminative, diuretic, emmenagogue, stimulant and tonic[4, 21, 165]. An infusion of the leaves is used to relieve flatulence and colic[254]. The plant, especially in the form of the essential oil, is most useful when applied externally in the treatment of acute

cases of rheumatism, sciatica, myalgia, sprains, neuralgia and catarrh[4, 238]. The oil is sometimes used in the treatment of cellulitis, a bacterial infection that causes the skin to become inflamed[254]. Some caution is advised, especially if the oil is used internally, since essential oil is toxic in excess, causing liver and kidney damage[4, 238]. It should not be prescribed for patients who are hypersensitive to salicylates (aspirin)[238]. The leaves can be gathered at any time from spring to early autumn, they are dried for use in infusions or distilled to produce the oil[238].

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division can be carried out at almost any time of the year, but works best in the spring just before new growth begins[K]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Ground cover, Massing, Rock garden, Woodland garden. Prefers a moist but not boggy humus rich soil in shade or semi-shade[11, 182]. A peat and moisture loving species, it requires a lime-free soil[11, 182]. Succeeds in dry soils once it is well established and tolerates considerable drought[208]. Grows well under the thin shade of deciduous shrubs or evergreens[4, 11]. A very cold-hardy plant, tolerating temperatures down to about -35°C[160]. Plants can become invasive when growing in good conditions[182]. Some named forms have been developed for their ornamental value, 'Dart's Red Giant' has specially large berries[182]. All parts of the plant are aromatic, the bruised leaves having the scent of wintergreen[245]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Fragrant foliage, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 4.2.49 Mentha x piperita vulgaris

Black Peppermint

3 tin 7 cyuc 4 kcaak 3 tcan 5 dwat 0.5 m hkuc  
hmimhtut cyutli tuc hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatti xre7t hjonli

drutta Mentha x piperita vulgaris is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and

can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Condiment Tea**Leaves - raw or cooked.** A strong peppermint flavour, they are used as a flavouring in salads or cooked foods[2, 27, 105]. This plant should not be used by pregnant women, see the notes above on toxicity. An essential oil from the leaves and flowers is used as a flavouring in sweets, chewing gum, ice cream etc[183]. A herb tea is made from the fresh or dried leaves[21, 183].

**tcanta Essential Repellent Strewing**An essential oil is obtained from the whole plant. It is used medically and as a food flavouring[2, 46, 57].. It is also an ingredient of oral hygiene preparations, toiletries etc[238]. Peppermint leaves are used as an ingredient of pot-pourri[238]. They were formerly used as a strewing herb[14]. The plant repels insects, rats etc[14, 18, 20]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. Dynamic accumulator.

**dwatta Abortifacient Anodyne Antiseptic Antispasmodic Aromatherapy Carminative Cholagogue Diaphoretic Refrigerant Stomachic Tonic Vasodilator**Black peppermint is a very important and commonly used herbal remedy, being employed by allopathic doctors as well as herbalists[9]. It is also widely used as a domestic remedy. This cultivar is considered to be stronger acting than white peppermint (*Mentha x piperita officinalis*). A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders (especially flatulence) and various minor ailments[222, 238]. The herb is abortifacient, anodyne, antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, refrigerant, stomachic, tonic and vasodilator[4, 9, 21, 165, 238]. An infusion is used in the treatment of irritable bowel syndrome, digestive problems, spastic colon etc[254]. Externally a lotion is applied to the skin to relieve pain and reduce sensitivity[254]. The leaves and stems can be used fresh or dried, they are harvested for drying in August as the flowers start to open[4]. The essential oil in the leaves is antiseptic and strongly antibacterial, though it is toxic in large doses[222, 254]. When diluted it can be used as an inhalant and chest rub for respiratory infections[254]. The essential oil is used in aromatherapy. Its keyword is 'Cooling'[210].

**propta Seed - sow spring in a cold frame.** Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

**nwatta** Succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for the production of essential oils, but plants also succeed in partial shade. Prefers a slightly acid soil[16]. A commonly grown herb[4], it is often cultivated commercially for its essential oil[61]. This is the black form of peppermint and it is said to produce a superior essential oil, making it the preferred choice as a food flavouring and for medicinal purposes. The oil is of better quality when the plant is grown on dry soils[115]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The flowers are very attractive to bees and butterflies[24]. A good companion for growing near cabbages and tomatoes, helping to keep them free of insect pests[20]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.50 *Dentaria diphylla*

Crinkleroot

3 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 0.3 m hkuc pcmhnmh cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Dentaria diphylla* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Leaves **Root****Edible Uses:** Root - raw or cooked[46, 61, 161]. It has a crisp texture and a pleasant pungent taste[43], rather like water cress or horseradish[183]. It can be added to salads or used as a relish[105, 183]. The root has a pungent acrid taste when first harvested, the Indians cleaned the roots, heaped them on a blanket, covered them to exclude air and then left them to ferment for 4 - 5 days. After this the roots developed a sweet taste[207]. Leaves - raw or cooked[257]. The cooking water was changed once in order to remove the bitterness[257].

**tcanta Miscellany**None known

**dwatta Cardiac Carminative** **Refruge** Miscellany **Odon-talgic Stomachic**The peppery root is used as a folk remedy in the treatment of toothache[222]. It has also been chewed in the treatment of colds, an infusion drunk to treat gas and other stomach problems, and it has been made into a poultice for headaches[222, 257]. A tea made from the root is gargled in the treatment of sore throat, hoarseness etc[222, 257]. An infusion of the plant has been used to treat fevers in children[257]. Combined with *Acorus calamus* root, it has been used in the treatment of heart diseases[257].

**propta** Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** An easily grown plant, preferring a rich light moist soil and a shady position[1]. This species is hardy to about -20°C[187]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.51 *Allium moly*

Golden Garlic, Ornamental Onion

3 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 6 m hkuc htuc cyutli hgatyuctup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Allium moly* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf from September to ?, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Flowers **Leaves** **Root****Edible Uses:** Bulb - raw or cooked. A pleasant mild garlic flavour, when sliced it makes a very nice addition to salads and can also be used as a flavouring in cooked foods[K]. The bulbs are about 25mm in diameter[200]. Leaves - raw or cooked. Flowers -

last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Cuttings of mature wood in late autumn. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

**nwatta** Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[17, 200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200].Tolerates some shade, succeeding in light woodland. Very tolerant of wind and exposure[186]. Plants do not always do well in sheltered positions and they fruit better in an exposed position[115]. They can also form the ground layer in acid woods[186]. A freely suckering shrub when growing well[182]. Plants quickly regenerate from below ground level if they are burnt and also tolerate some grazing[186]. One report says the plant is self-sterile[3], another that it is self-fertile[17]. The fruits are relished by wildlife and the plants provide food for a number of insect species[186]. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 4.2.60 *Quercus x hybrid*

Burgambel oak

3 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 30 m hkuc hmimhtut cyutli hgatyuctup hwicli jltunyk hpa7tli flatprikliwis hpa7tmwatli hjonli

**drutta** *Quercus x hybrid* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Seed**Edible Uses:** Carbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

**tcanta Fodder**Carbon Farming Solutions - Industrial Crop: tannin (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles)[1-1]. Fodder: mast. Drought-tolerant; suitable for xeriscaping

**dwatta** DysenteryNone Report. As a cross between *Quercus macrocarpa* and *Quercus gambelii* we may expect some of the medicinal qualities to be present. *Quercus macrocarpa* has Antispasmodic; Astringent; and Tonic qualities. The bark is astringent and tonic[61]. An infusion has been used in the treatment of diarrhoea[257]. A decoction of the root or inner bark has been used in the treatment of cramps[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. *Quercus gambelii* has Analgesic; Astringent; and Cathartic properties. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. The acorns have been eaten to give greater sexual potency[257]. The root bark is analgesic and cathartic[257]. A decoction has been used to treat postpartum pain and facilitate delivery of the placenta[257].

**propta** Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their

permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

**nwatta** Experimental Crop Fodder: Mast **Industrial Crop: Tannin Management: Standard Staple Crop: Balanced carb**Climate: boreal to warm temperate. Humidity: semi-arid to humid. A naturally occurring cross between the bur oak, whose native range is in the eastern U.S., and the Gambel oak, whose native range is in the southwestern U.S. and Mexico. It is a member of the white oak group and produces abundant acorns annually. The mature size of the tree can vary from large tree (typical of bur oaks) to medium tree/large shrub (typical of Gambel oaks) depending on its environment. Both parents are known to be tough and drought-tolerant. Burgambel acorns are low in tannins and relatively quick to bear, between three and six years [1-1]. The low tannins make them more palatable. Burgambel begins producing acorns at a young age when the trees are only 3-6 feet tall. The acorns ripen early in the season.Burgambel averages 1-2 ft. in height per year. Carbon Farming Solutions - Cultivation: experimental as food. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 4.2.61 *Acer saccharinum*

Silver Maple, River Maple, Soft Maple

3 tlin 9 cyuc 3 kcaak 4 tcan 1 dwat 30 m hkuc hmimhtut cyutli tcup hwicli hrasljutykifrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Acer saccharinum* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from February to March, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Inner bark **Leaves** **Sap** **Seed****Edib**l**Uses:** SweetenerThe sap contains sugar and can be used as a drink or be concentrated into a syrup by boiling off the water[4, 61, 82, 159]. The syrup is used as a sweetener on many foods. The yield is only half that of *A. saccharum*[2]. It is said to be sweeter and whiter than *A. saccharum*[183]. The sap can be harvested in the late winter, the flow is best on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. Self-sown seedlings, gathered in early spring, are eaten fresh or dried for later use[177, 213]. Seeds - cooked. The wings are removed and the seeds boiled then eaten hot[213]. Good crops are produced nearly every year in the wild[229]. The seed is about 12mm long and is produced in small clusters[82]. Inner bark - cooked. It is dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 161, 177, 257]. The related Oregon Maple (*Acer macrophyllum*) has yellow flower clusters, sweet with nectar, eaten raw[183]. No information was found for this species. Carbon farming - Staple Crop: sugar.

**tcanta** Companion Dye Fodder Preservative Rust Shelterbelt WoodThe leaves are packed around apples, root crops etc to help preserve them[18, 20]. A fairly wind-tolerant tree, it can be used in shelterbelt plantings[200]. The branches are rather brittle, however, and can break off even in minor storms[226]. The stems are used in making baskets[257]. The boiled inner bark yields a brown dye[106]. Mixed with lead sulphate this produces a blue/black dye which can also be used as an ink[106]. A black dye is obtained from the twigs and bark[257]. The bark can be boiled, along with hemlock (*Tsuga* spp) and swamp oak bark (*Quercus bicolor*) to make a wash to remove rust from iron and steel, and to prevent fur-

division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta A very easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade[4]. Prefers partial shade and a slightly acid soil[4, 16]. Often grown as a culinary herb in the herb garden, spearmint is also commercially cultivated for its essential oil, the yields are about 3.5 to 4.5 kilos per tonne of leaves. There are some named varieties[200, 238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The whole plant has a strong spearmint smell. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests[14, 20]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone, 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2]. Can be grown in containers.

### 4.2.58 Medeola virginiana

Indian Cucumber Root
3 tlin 7 cyuc 4 kcaak 1 tcan 1 dwat 0.3 m hkuc
hmim cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Medeola virginiana is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - raw or cooked[55, 62]. Crisp and tender with the aroma and taste of cucumbers[1, 2, 102, 183]. A sweet flavour[159]. The root is up to 8cm long[200].

tcanta Scented plant.

dwatta Antispasmodic Diuretic HydrogogueThe root is diuretic and hydrogogue[4]. It is used in the treatment of dropsy[4]. An infusion of the crushed dried berries and leaves has been used to treat babies with convulsions[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame in a well-drained soil-less medium[200]. Fully remove the fleshy seed covering because this contains germination inhibitors. The seed should germinate in the spring[K]. Spring sown seed can be slow to germinate and may take 12 months or more[K]. The seed should be sown thinly so that the seedlings can be grown on undisturbed in the pot for their first year. If necessary apply a liquid feed at intervals through the growing season to ensure that the plants grow on well. Prick the roots out into individual pots

in the autumn and grow them on in a shady part of the greenhouse for at least the next growing season, planting them out into their permanent positions when they are dormant. Division in spring as the plant comes into growth[1].

nwatta Prefers light shade and plenty of leaf mould in a slightly acid soil[200]. Prefers a rich sandy soil[1]. The root-stock has a pleasant refreshing smell of cucumber[245]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.59 Vaccinium myrtillus

Bilberry, Whortleberry
3 tlin 7 cyuc 4 kcaak 1 tcan 3 dwat w m hkuc
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli fyfxre7t hjonli

drutta Vaccinium myrtillus is a deciduous Shrub growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked[183]. Sweet and very tasty[2, 3, 5, 7, 8, 9, 13], they make an excellent preserve, their small seeds making them suitable for jam[4]. A slightly acid flavour when eaten raw[4]. The fruit can be dried and used like currants[12]. The fruit is up to 10mm in diameter[200]. A tea is made from the leaves[4, 177, 183].

tcanta Dye InkA green dye is obtained from the leaves and the fruit and is used to colour fabrics[7]. A blue or black dye is obtained from the fruit[100, 141]. This can be used as an ink[66].

dwatta Antidiarrhoeal Antiemetic Antiseptic Astringent Diuretic Hypoglycaemic Kidney Ophthalmic Tonic Urinary-The dried leaves of bilberries are used in the treatment of a variety of complaints[4]. These leaves should be harvested in early autumn, only green leaves being selected, and then dried in gentle heat[4]. The leaves should not be used medicinally for more than 3 weeks at a time[254]. A tea made from the dried leaves is strongly astringent, diuretic, tonic and an antiseptic for the urinary tract[4]. It is also a remedy for diabetes if taken for a prolonged period[4]. Another report says that the leaves can be helpful in pre-diabetic states but that they are not an alternative to conventional treatment[254]. The leaves contain glucoquinones, which reduce the levels of sugar in the blood[238]. A decoction of the leaves or bark is applied locally in the treatment of ulcers and in ulceration of the mouth and throat[4]. A distilled water made from the leaves is an excellent eyewash for soothing inflamed or sore eyes[7]. Whilst the fresh fruit has a slightly laxative effect upon the body, when dried it is astringent and is commonly used in the treatment of diarrhoea etc[4, 7, 254]. The dried fruit is also antibacterial and a decoction is useful for treating diarrhoea in children[254]. The skin of the fruits contains anthocyanin and is specific in the treatment of hemeralopia (day-blindness)[7]. The fruit is a rich source of anthocyanosides, which have been shown experimentally to dilate the blood vessels[238], this makes it a potentially valuable treatment for varicose veins, haemorrhoids and capillary fragility[254].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the

raw. The yellow flowers make an attractive garnish on salads and have a pleasant onion flavour[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required. Plants sometimes produces bulbils, these can be potted up as soon as they are ripe and planted out in late spring.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden, Woodland garden. An easily grown plant[203], preferring a sunny position in a light well-drained soil[1, 90]. Established plants are fairly drought tolerant[190]. The bulbils should be planted fairly deeply[1]. The dormant bulbils are fairly hardy and will withstand soil temperatures down to at least -10°C[214]. There are some named forms selected for their ornamental value[203]. The flowers are softly scented[245]. Some forms of this species, especially A. moly bulbiferum[203], produce bulbils in the flowering head[42] and can be invasive[203]. The species type is sometimes considered to be invasive, though it has not proved so with most people[203]. It is useful for naturalising between shrubs and grows well at the base of a beech hedge in a wet garden[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. It is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Not North American native, Naturalizing, Attracts butterflies, Suitable for dried flowers.

### 4.2.52 Carum carvi

Caraway
3 tin 9 cyuc 4 kcaak 3 tcan 3 dwat 0.6 m hkuc
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Carum carvi is a BIENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). It is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves Root SeedEdible Uses: Condiment TeaSeed - raw or cooked. A spicy flavour, it is used as a flavouring in confectionery and bread, also as a flavouring in salads, vegetables etc[2, 4, 5, 9, 18, 20, 27, 183]. It is high in protein and fat[14]. The seed is often chewed after a meal in order to sweeten the breath and also to relieve heartburn after a rich meal[244]. Per 100g, the seed contains 333 calories, 10g water, 20g protein, 14.5g fat, 50g carbohydrate, 12.5g fibre, 6g ash, 689mg calcium, 568mg phosphorus, 16.2mg iron, 258mg magnesium, 17mg sodium, 1351mg potassium, 5.5mg zinc, 363 IU vitamin A, 0.383mg thiamine, 0.379mg riboflavin, 3.61mg niacin[218]. An essential oil from the seed is used as a flavouring in ice creams, candy, soft drinks etc[183, 238]. It is an essential ingredient of the liqueur kummel[244]. Root - cooked[183]. Used as a vegetable like parsnips[2, 4, 9, 14, 55, 115]. Stronger in taste than parsnips, but liked by many[207]. A delicious vegetable[244]. Leaves - raw or as a flavouring in soups etc[2, 14, 27, 55, 115]. The young leaves are much less spicy than the seeds and are a good salad[9], having a mild

parsley-dill flavour[238]. They give an aromatic tang to salads[244]. Older leaves can be cooked as a spinach[183]. The crushed seeds are brewed into a tea[183]. It has a soothing effect on the digestion[244].

tcanta Essential ParasiticideAn essential oil from the seed is used in perfumery, for scenting soap, as a parasiticide etc[7, 46, 74, 171]. Twenty-five kilos of seed yield about 1 kilo of essential oil[4]. The essential oil yield of the seed from plants cultivated in Poland is up to 10.33%[240]. Caraway is also used as a breath freshener.

dwatta Antiseptic Antispasmodic Aromatic Carminative Digestive Emmenagogue Expectorant Galactogogue Ophthalmic Parasiticide StimulantCaraway has a long history of use as a household remedy especially in the treatment of digestive complaints where its antispasmodic action soothes the digestive tract and its carminative action relieves bloating caused by wind and improves the appetite[4, 238, 254]. It is often added to laxative medicines to prevent griping[238]. The seed is antiseptic, antispasmodic, aromatic, carminative, digestive, emmenagogue, expectorant, galactogogue and stimulant[4, 7, 9, 21, 46, 165, 222, 240]. It can be chewed raw for the almost immediate relief of indigestion and can also be made into infusions[238]. The seed is also used in the treatment of bronchitis and are an ingredient of cough remedies, especially useful for children[254]. The seed is also said to increase the production of breast milk in nursing mothers[254]. The seed is harvested when fully ripe, then dried and stored in a cool, dry place out of the sunlight[244]. The essential oil can be extracted from the seed and has similar properties[4]. A tea made from the seeds is a pleasant stomachic and carminative, it has been used to treat flatulent colic[207, 222]. The seed is used in Tibetan medicine where it is considered to have an acrid taste and a heating potency[241]. It is used to treat failing vision and loss of appetite[241]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Carum carvi* for dyspeptic complaints (see [302] for critics of commission E).

propta Seed - it is best sown in situ as soon as it is ripe in late summer and early autumn[4, 200]. The seed can also be sown March/April in situ[200], though in areas with cool summers the plants might not produce a crop of ripe seeds[238]. Plants are very sensitive to root disturbance and should not be transplanted.

nwatta Succeeds in ordinary garden soil as long as it is not too wet in winter[1]. Prefers a moist soil in full sun or partial shade[4, 200]. Tolerates a pH in the range 4.8 to 7.6. Caraway is a well-known herb that has been cultivated for its culinary and medicinal uses since ancient times[244]. It is frequently cultivated in the modern herb garden and sometimes also commercially[4, 46], there are some named varieties[183]. Plants growing in more northerly latitudes and also in full sun are richer in essential oils and therefore more aromatic[4, 245]. Plants strongly resent root disturbance[200]. They often self-sow freely when in a suitable location[244]. This species is deep rooted[201] and is a good plant for breaking up the sub-soil on heavy, wet land[18, 20]. It dislikes growing near fennel or wormwood[14, 20] but is a good companion for most plants, especially those that are shallow-rooted[201]. The flowers attract parasitic wasps to the garden, these prey on aphids and so help to reduce populations of insect pests[238].

### 4.2.53 Claytonia sibirica

Pink Purslane, Siberian springbeauty
3 tlin 7 cyuc 4 kcaak 3 tcan 1 dwat 0.2 m hkuc
pccmimimhtut cyutli kyuctucup hwicli hyishrasljutnyik hpa7tli frusflatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Claytonia sibirica is an evergreen Annual/Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from April to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in

full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Leaves - raw or cooked[2, 62, 183]. They usually have a fairly bland flavour and are quite nice in a salad or cooked as a green vegetable. The leaves have a distinct earthy after-taste rather like raw beetroot[K]. They are available all year round but can turn rather bitter in the summer, especially if the plant is growing in a hot dry position[K]. Although on the small side, the leaves are produced in abundance and are very easily harvested[K].

**tcanta** A good ground cover plant for a shady position[208]. This species is a short-lived perennial but it usually self-sows freely and gives a dense weed-excluding ground cover[K].

**dwatta Antidandruff Diuretic Ophthalmic Poultice**The plant is diuretic[257]. A poultice of the chewed leaves has been applied to cuts and sores[257]. The juice of the plant has been used as eye drops for sore red eyes[257]. A cold infusion of the stems has been used as an antidandruff wash for the hair[257].

**propta Seed** - sow spring or autumn in situ. The seed usually germinates rapidly.

**nwatta** A very tolerant and easily grown plant, it prefers a moist peaty soil[1] and is unhappy in dry situations[K]. It succeeds in full sun[200] though is happier when given some shade and also grows in the dense shade of beech trees[88]. Plants usually self-sow freely[200, K]. This is an excellent and trouble-free salad plant. It is extremely cold-hardy and can provide edible leaves all year round in all areas of the country even if it is not given protection[K]. *Montia sibirica* (L.) Howell is a synonym of *Claytonia sibirica* L. For polyculture design as well as the above-ground architecture (form - herb, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 4.2.54 *Campanula poscharskyana*

Trailing Bellflower

3 tlin 7 cyuc 4 kcak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli prikliwis  
hpa7tmwatli fyifxre7t hjonli

**drutta** *Campanula poscharskyana* is an evergreen Perennial growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers**LeavesEdible Uses:** Leaves - raw or cooked[K]. A pleasant sweet flavour but the leaves are a little tough[K]. It makes a very addition to mixed salads in the winter, though we tend not to eat it much at other times of the year when there are more leaves available[K]. Flowers - raw. Produced in abundance, they have a pleasant sweet flavour and make a decorative addition to the salad bowl[K].

**tcanta** A rampantly spreading plant, suitable for ground cover in a sunny position[187, 197, 208].

**dwatta** None known

**propta Seed** - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy, the plant can be divided at almost any time of the year[211].

**nwatta** Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in full sun though it also tolerates partial shade[1, 200, 208]. We have seen plants doing very well on a north-west-facing wall[K]. Plants are very drought-tolerant and can be grown on a dry stone wall[200], they also succeed in poor soils[221]. Plants are hardy to at least -15°C[200]. A rampant spreading plant[188], it makes an excellent ground cover but can become a nuisance if it isn't sited with care[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. This species does not produce seed very freely in Britain, but it is very easily propagated by division[221]. There are several named forms selected for their ornamental value[200]. The form 'E.K.Toogood' is less invasive[197]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.55 *Smilacina stellata*

Star-Flowered Lily Of The Valley

3 tlin 7 cyuc 4 kcak 0 tcan 2 dwat 0.6 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyk hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

**drutta** *Smilacina stellata* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Fruit** - raw or cooked[105, 161]. The fruit is about the size of a pea and is produced on the plant in small terminal clusters of about 2 - 8 berries[256]. It has a nice bitter-sweet flavour that is somewhat reminiscent of treacle[85, K]. The fruit is a good source of vitamin C, it has been used to prevent scurvy[213]. The fruit is said to be laxative in large quantities when eaten raw, especially if you are not used to eating it, though thorough cooking removes this laxative effect[K]. Young leaves - raw or cooked. The young shoots, as they emerge in spring, can be used as an asparagus substitute[85]. The young shoots and leaves are cooked and used as greens[212]. Root - cooked. It should be soaked in alkaline water first to get rid of a disagreeable taste[85, 213]. It can be eaten like potatoes[213].

**tcanta** Plants can be grown as a ground cover when planted about 60cm apart each way[208]. An inferior cover to *S. racemosa*[208].

**dwatta** Vitamin CStar-flowered lily of the valley was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. A tea made from the roots is drunk to regulate menstrual disorders[213]. A decoction of the leaves is taken 2 - 3 times a day in the treatment of rheumatism and colds[257]. Half a cup of leaf tea drunk daily for a week by a woman is said to prevent conception[213, 257]. The root is analgesic, antiseptic, haemostatic, ophthalmic, stomachic and vulnerary[257]. An infusion has been used in the treatment of stomach complaints, internal pains and to regulate menstrual disorders[257]. The dried powdered root has been used in treating wounds and bleeding[213, 257]. The crushed root has been used as a poultice on sprains, boils, swellings and limbs affected by rheumatism[257]. The pulped root has been used as ear drops to treat ear aches[257]. An infusion of the roots has been used as a wash for inflamed eyes[257].

**propta Seed** - best sown as soon as it is ripe in a cold frame. The seed can be very slow to germinate, often taking 18 months. Stored seed should be sown in a cold frame as soon as possible, it may take 2 years or longer to germinate. Grow the seedlings on in a shady part of a greenhouse for their first year without pricking them out, giving them liquid or foliar feeds as required to ensure that they do not become nutrient deficient. Divide the young plants up into individual pots in the autumn when they are dormant, and grow them on for at least another year in a shady part of the greenhouse. When the plants have reached a sufficient size, plant them out in the autumn whilst they are dormant. Division in spring or early autumn. Very easy, larger divisions

can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

**nwatta** Requires a deep fertile humus rich moisture retentive soil, neutral to slightly acid, that does not dry out in the growing season, and a shady position[200]. Does well in a woodland garden[200]. Plants have a creeping rhizome and can form extensive patches[187]. Fruits well in a shady woodland position at Kew[K]. Hardy to about -25°C[187]. Plants are slow to establish but then can become invasive[208]. The flowers are powerfully scented[245].

## 4.2.56 *Portulaca oleracea*

Green Purslane, Little hogweed

3 tlin 12 cyuc 4 kcak 2 tcan 3 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis  
hpa7tmwatli fyifxre7t hjonli

**drutta** *Portulaca oleracea* is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**SeedEdible Uses:** SaltLeaves and stems - raw or cooked[1, 4, 12, 27, 37]. The young leaves are a very acceptable addition to salads, their mucilaginous quality also making them a good substitute for okra as a thickener in soups[4, 183]. Older leaves are used as a potherb[4]. The leaves have a somewhat sour flavour[85]. A spicy and somewhat salty taste[9]. The leaves are a source of omega-3 fatty acids, though seed sources such as walnuts are magnitudes richer[222]. The leaves can be dried for later use[85]. They contain about 1.8% protein, 0.5% fat, 6.5% carbohydrate, 2.2% ash[179]. Another analysis gives the following figures per 100g ZMB. 245 - 296 calories, 17.6 - 34.5g protein, 2.4 - 5.3g fat, 35.5 - 63.2g carbohydrate, 8.5 - 14.6g fibre, 15.9 - 24.7g ash, 898 - 2078mg calcium, 320 - 774mg phosphorus, 11.2 - 46.7mg iron, 55mg sodium, 505 - 3120mg potassium, 10560 - 20000ug B-carotene equivalent, 0.23 - 0.48mg thiamine, 1.12 - 1.6mg riboflavin, 5.58 - 6.72mg niacin and 168 - 333mg ascorbic acid[218]. Seed - raw or cooked[62, 102, 159]. The seed can be ground into a powder and mixed with cereals for use in gruels, bread, pancakes etc[183, 193]. The seed is rather small and fiddly to utilize[85]. In arid areas of Australia the plants grow quite large and can produce 10, 000 seeds per plant, a person can harvest several pounds of seed in a day. The seeding plants are uprooted and placed in a pile on sheets or something similar, in a few days the seeds are shed and can be collected from the sheet[193]. In Britain, however, yields are likely to be very low, especially in cool or wet summers[K]. The seed contains (per 100g ZMB) 21g protein, 18.9g fat 3.4g ash[218]. Fatty acids of the seeds are 10.9% palmitic, 3.7% stearic, 1.3% behenic, 28.7% oleic, 38.9% linoleic and 9.9% linolenic[218]. The ash of burnt plants is used as a salt substitute[183].

**tcanta** None known

**dwatta** Antiscorbatic Depurative Diuretic Febrifuge Skin Tonic VermifugeThe plant is antibacterial, antiscorbatic, depurative, diuretic and febrifuge[4, 7, 147, 152, 238]. The leaves are a rich source of omega-3 fatty acids, which is thought to be important in preventing heart attacks and strengthening the immune system[238]. Seed sources such as walnuts, however, are much richer sources[222]. The fresh juice is used in the treatment of strangury, coughs, sores etc[4, 7, 147, 152]. The leaves are poulticed and applied to burns[222], both they and the plant juice are particularly effective in the treatment of skin diseases and insect stings[7, 238]. A tea made from the leaves is used in the treatment of stomach aches and headaches[222]. The leaf juice is applied to earaches, it is also said to alleviate caterpillar stings[222]. The leaves can be harvested at any time before the plant flowers, they are used fresh or dried[238]. This remedy is not given to pregnant women or to patients

with digestive problems[238]. The seeds are tonic and vermifuge[218, 240]. They are prescribed for dyspepsia and opacities of the cornea[218].

**propta Seed** - for an early crop, the seed is best sown under protection in early spring and can then be planted out in late spring[4]. Outdoor sowings in situ take place from late spring to late summer, successional sowings being made every two to three weeks if a constant supply of the leaves is required[4].

**nwatta** Requires a moist light rich well-drained soil in a sunny position[4, 37, 200]. Plants will not produce good quality leaves when growing in dry conditions[4]. A perennial plant in warmer climates than Britain, purslane is killed by frost but can be grown as a half-hardy annual in this country[1]. It can become an aggressive weed in areas where the climate suits it[274]. The flowers only open in full sunlight[244]. Purslane is occasionally cultivated for its edible leaves, there are some named varieties[183]. The plants take about six to eight weeks to produce a crop from seed and can then be harvested on a cut and come again principle, providing edible leaves for most of the summer[4].

## 4.2.57 *Mentha spicata*

Spearmint

3 tlin 9 cyuc 4 kcak 3 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikwi  
hpa7tmwatli xre7t hjonli

**drutta** *Mentha spicata* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in highly clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Condiment TeaLeaves - raw or cooked. A strong spearmint flavour, they are used as a flavouring in salads or cooked foods[2, 4, 5, 183]. The leaves are often used in 'mint sauce', which is used as a flavouring in meals[238]. A herb tea is made from the fresh or dried leaves[21, 183]. It has a very pleasant and refreshing taste of spearmint, leaving the mouth and digestive system feeling clean[K]. An essential oil from the leaves and flowers is used as a flavouring in sweets, ice cream, drinks etc[46, 57, 183]. A spearmint flavour[183].

**tcanta** Essential Repellent StrewingAn essential oil is obtained from the whole plant, the yield is about 4K of oil from 1 tonne of leaves[46, 57]. The oil is used commercially as a food flavouring and oral hygiene preparation[238]. The plant repels insects and was formerly used as a strewing herb[14, 18, 20]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

**dwatta** Antiemetic Antiseptic Antispasmodic Cancer Carminative Diuretic Poultice Restorative Stimulant StomachicSpearmint is a commonly used domestic herbal remedy. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The herb is antiemetic, antispasmodic, carminative, diuretic, restorative, stimulant and stomachic[4, 21, 46, 218]. The leaves should be harvested when the plant is just coming into flower, and can be dried for later use[4]. The stems are macerated and used as a poultice on bruises[218]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222]. Both the essential oil and the stems are used in folk remedies for cancer[218]. A poultice prepared from the leaves is said to remedy tumours[218].

**propta Seed** - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by

the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Landscape Uses:Alpine garden, Border, Ground cover, Rock garden, Specimen. Prefers a light, well-drained calcareous soil and a sunny position[200]. Plants tolerate occasional walking on and can be grown in cracks in paths, they also succeed on walls[200]. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to at least -15°C[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native. Heat Zone: 9-1.

### 4.2.233 Calochortus pulchellus

Mount Diablo Globelily, Mt. diablo fairy-lantern

3 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmmihhut cyutli kyuctup hwicli hraslut hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Calochortus pulchellus is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[46, 61, 105, 161, 257]. Rather small, usually smaller than a persons thumb, but easily harvested[207].

tcanta None known

dwatta None known

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a warm sunny position and must be kept dry over winter[1, 200]. Another report says that it is best grown in a good, very gritty soil in sun or semi-shade in a bulb frame[90]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1]. Another report says that the plant requires plenty of moisture when in growth, but very dry conditions after it has flowered[245]. It is easiest to grow in a bulb frame but this species is one of the least difficult

of the genus[90] and is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that they should be replanted immediately[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1]. The flowers are sweetly scented[245]. This species is closely related to *C. amabilis*[200].

### 4.2.234 Camassia cusickii

Cussick's camas

3 tin 11 cyuc 2 kcaak 3 tcan 0 dwat 0.9 m hkuc  
hmmihhut cyutli tcup hwicli hraslut hpa7tli flatprikliwis  
hpa7tmwatli hjonli

drutta Camassia cusickii is a BULB growing to 0.9 m (3ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb. The cooked bulb has a sweet, anise-squash flavour. Pressure cook at 250°F or 120°C for nine hours. A larger bulb than other species in this genus but the flavour is considered poorer [1-2]. Considered pungent, slimy, and bitter tasting by some (summitpost.org). The bitter taste is due to saponins in the plant. Commonly confused with *C. quamash* where Native Americans would harvest the roots to eat raw as a vegetable, or boiled them to create a sweet, molasses-like treat.

tcanta Uses include food forests, informal gardens, cottage gardens, prairie and meadows. Locations include: garden banks and slopes, beds and borders and can be underplanted with roses and other shrubs. Showy, cut flowers. Thrives among perennials. *C. cusickii* can naturalize and serve as a good ground cover.

dwatta None Known

propta Propagated by removing the offsets that have formed round the main bulbs. Plant 6 inches (150 mm) deep in late summer or early fall. In very cold areas, the soil should be mulched to protect the bulbs in late autumn.

nwatta Hardy Perennial Bulb found in temperate to subtropical locations. Prefers moist, fertile soil in full sun to partial sunlight. Soil chalk, loam or sand which is acid, alkaline or neutral. It tolerates clay and dry soil. Soil moisture moist but well-drained. Unlike most bulbs, it prefers soil that has a bit more moisture but is intolerant of waterlogging. Deer- and rodent-resistant. Flowers spring to early summer. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 4.2.235 Leucanthemum vulgare

Ox-Eye Daisy, Marguerite

3 tin 9 cyuc 2 kcaak 2 tcan 2 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hraslutnyik hpa7tli prikliwis  
hpa7tmwatli fyifxre7t hjonli

drutta Leucanthemum vulgare is a PERENNIAL growing to 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and

leaves at the bottom of the potato trench or apply them as a mulch in no-dig gardens. A liquid feed can be obtained by soaking the leaves in a small amount of water for a week, excellent for potassium demanding crops such as tomatoes. The leaves are also a very valuable addition to the compost heap[26, 200]. A gum obtained from the roots was at one time used in the treatment of wool before it was spun[100]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anodyne Antidiarrhoeal Antirheumatic Astrigent Demulcent Eczema Emollient Expectorant Haemostatic Homeopathy Refrigerant VulneraryComfrey is a commonly used herbal medicine with a long and proven history in the treatment of various complaints. The root and the leaves are used, the root being more active, and they can be taken internally or used externally as a poultice[4, 222]. Comfrey is especially useful in the external treatment of cuts, bruises, sprains, sores, eczema, varicose veins, broken bones etc, internally it is used in the treatment of a wide range of pulmonary complaints, internal bleeding etc[4, 238, K]. The plant contains a substance called 'allantoin', a cell proliferant that speeds up the healing process[4, 21, 26, 165, 222, 238]. This substance is now synthesized in the pharmaceutical industry and used in healing creams[238]. The root and leaves are anodyne, astringent (mild), demulcent, emollient, expectorant, haemostatic, refrigerant, vulnerary[4, 21, 26, 165, 222]. Some caution is advised, however, especially in the internal use of the herb. External applications and internally taken teas or tinctures of the leaves are considered to be completely safe, but internal applications of tablets or capsules are felt to have too many drawbacks for safe usage[238]. See also the notes above on toxicity. The leaves are harvested in early summer before the plant flowers, the roots are harvested in the autumn. Both are dried for later use[238]. A homeopathic remedy is made from the fresh root, harvested before the plant flowers[232]. This has a very limited range of application, but is of great benefit in the treatment of broken bones and eye injuries[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Symphytum officinale* for blunt injuries (see [302] for critics of commission E).

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta Landscape Uses:Border, Ground cover, Specimen. Tolerates moist soils and situations but prefers a moist soil and some shade[1, 4]. Grows well in heavy clay soils. Best grown in an open sunny site in a deep rich soil if it is being grown for compost material[200]. Plants can be invasive, often spreading freely by means of self-sown seed. The root system is very deep and difficult to eradicate, even small fragments of root left in the soil can produce new plants. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is fleshy. Thick or swollen - fibrous or tap root [1-2].

### 4.2.108 Campanula latifolia

Large Campanula, Giant bellflower

3 tin 7 cyuc 3 kcaak 0 tcan 1 dwat 1.5 m hkuc  
pcimhmm cyutli kyuctcup hwicli hraslutnyikfrip hpa7tli  
prikliwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula latifolia is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Young shoots - raw or cooked[5, 177]. Contains up to 400mg% of vitamin C[174]. Root - raw[74]. This report is rather vague and needs further investigation. Flowers - raw or cooked. A pleasant sweetness[K].

tcanta None known

dwatta Emetic Vitamin CThe flowers are emetic[61].  
propta Seed - surface sow in spring in a cold frame.

Three or four weeks pre-chilling of the seed improves the germination rate[138]. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can also be sown outdoors in situ during the spring. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[111]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta A very robust plant, capable of succeeding in the wild garden and tolerating considerable neglect[271]. It succeeds in most fertile well-drained soils[233], though it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Prefers a humus-rich soil in shade or partial shade[271]. Grows well in cool moist woodlands with light shade where it can spread freely[1]. Plants occasionally grow in old walls[219] and also succeed in the dry shade of trees[233]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very ornamental plant, there are some named varieties[187]. The species can be quite invasive, though most of the cultivars that have been selected for flower colour are less rampant[271].

### 4.2.109 Amaranthus tricolor

Chinese Spinach, Joseph's-coat, Fountain Plant, Tampala , Summer Poinsettia

3 tin 11 cyuc 3 kcaak 2 tcan 1 dwat 1 m hkuc  
htut cyutli hgattcup hwicli hwashturhnyik hpa7tli frusflat-  
prikliwis hpa7tmwatli fyif hjonli

drutta Amaranthus tricolor is a ANNUAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from April to October, in flower from June to August, and the seeds ripen from July to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

**kcakta Edible Parts:** Leaves Seed Stem**Edible Uses:** Leaves - raw or cooked. Often used at the young seedling stage[2, 46, 61], they are also cooked as a spinach and have a very mild flavour[183]. An excellent hot weather substitute for spinach[183]. The leaves contain about 3.5% protein, 0.25% fat, 6.6% carbohydrate, 3.1% ash, 24mg iron per 100g, 464mg calcium per 100g, they are rich in vitamin A and have a fair content of vitamins B1 and C[179]. On a zero moisture basis 100g of the leaves contains up to 2441mg calcium, 1008mg phosphorus, 51mg iron, 34mg sodium, 4475mg potassium, 37,623 micrograms beta-carotene equivalent, 0.68mg thiamine, 2.37mg riboflavin, 11.48mg niacin and 730mg ascorbic acid[218]. The crisp interior of large stems makes a tasty vegetable[183]. It can be eaten raw or cooked as an asparagus substitute[2, 61]. Seed - cooked[22, 177]. Very small, about 1mm in diameter[266], but easy to harvest and very nutritious. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K]. The seed contains saponins[218]. If this is the case it is probably best to either soak the seed for at least 12 hours and then rinse thoroughly before cooking or to give the seed a long slow cooking in order to destroy the saponins[K].

**tcanta Dye**Yellow and green dyes can be obtained from the whole plant[168].

**dwatta Astringent**The whole plant is astringent[240]. A decoction of the root is used with *Cucurbita moschata* to control haemorrhage following abortion[218]. A decoction of very old plants is taken internally to improve vision and strengthen the liver.

**propta Seed** - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A minimum soil temperature of 10°C is required for germination, germination is better at temperatures above 20°C[206]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

**nwatta Landscape Uses:**Border, Container, Foundation, Specimen. Prefers a light well-drained fertile soil in a sunny position[200, 206], though it does succeed in heavier soils[206]. Tolerates fairly acid soils[206]. Tolerates a pH in the range 4.3 to 7.8. This is basically a tropical plant and so requires a hot sheltered position in temperate climates if it is to do well[206, K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. A polymorphic species[1], it is often cultivated for its edible leaves, there are many named varieties[206]. This species is often cultivated in Asia for its edible leaves and seed[46, 58]. It is a very ornamental plant and is often grown in the flower garden[200]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. **Special Features:**Attractive foliage, Edible, Suitable for cut flowers, Suitable for dried flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

### 4.2.110 *Ribes aciculare*

3 tin 7 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc  
 hminhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Ribes aciculare* is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[105]. Large, sweet and tasty[2, 74]. The red fruit is up to 15mm in diameter[266].

**tcanta** None known  
**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 0 - 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

**nwatta** Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Quite tolerant of shade though not fruiting so well in such a position[11]. The dormant plant is hardy to about -20°C[200]. This species is closely related to *R. burejense*[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

### 4.2.111 *Asclepias incarnata*

Swamp Milkweed, Swamp Butterfly Weed, Marsh Milkweed  
 3 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 1.2 m hkuc  
 hminhtut cyutli kyuctcuphja7n hwicli hrasljutnyikfrrip hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

**drutta** *Asclepias incarnata* is a PERENNIAL growing to 1.2 m (4ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

**kcakta Edible Parts:** Flowers Leaves Oil Seedpod**Edibl Uses:** Oil SweetenerUnopened flower buds - cooked[46, 61, 161]. Tasting somewhat like peas[85]. They can also be dried and stored for later use[183]. Young shoots - cooked. An asparagus substitute[85, 106]. Tips of older shoots are cooked like spinach[85]. Young seed pods, harvested when 3 - 4 cm long - cooked. A pea-like flavour, they are very appetizing[85]. The flower clusters can be boiled down to make a sugary syrup[85].

**tcanta Fibre** Latex Oil Pollution Stuffing WaxA good quality fibre is obtained from the bark[46, 57, 61, 95, 112, 169]. It is used in twine, cloth etc[112]. It is easily harvested in late autumn, after the plants have died down, by simply pulling it off the dead stems[112]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[57, 171]. It is a Kapok substitute, it is used in Life Jackets or as a stuffing material[169, 171]. It is very water repellent. The floss has also been used to mop up oil spills at sea. Rubber can be made from latex contained in the leaves and stems[57]. Pods contain an oil and a wax which are of potential importance[171]. The dogbane-milkweed family *Asclepias*, *Apocynum*, *Calotropis*, and *Trachomitum* spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed finer or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

**dwatta** Anthelmintic Carminative Diuretic Emetic Laxative StomachicA tea made from the roots is anthelmintic, carminative, diuretic, emetic, strongly laxative and stomachic[4, 61, 222, 257]. The tea is said to remove tapeworms from the body in one hour[257]. It has also been used in the treatment of asthma, rheumatism, syphilis, worms and as a heart tonic[4, 207, 222]. An infusion of the roots is used as a strengthening bath for children and adults[257].

pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Root**Edible Uses:** Bulb - raw or cooked[92, 105, 161]. About the size of a walnut, it is very palatable and nutritious[2]. The bulb can be harvested in early spring, peeled and eaten raw[257]. It can also be baked and eaten like potatoes[257]. The bulb can be used as a staple food[2].

**tcanta** None known  
**dwatta** None known

**propta Seed** - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

**nwatta** Requires a deep very well-drained fertile sandy soil in a warm sunny position and must be kept rather dry after it flowers and over winter[1, 90, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[42, 90]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs have succeeded in a cold frame with the cover removed from March to October[214]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that the bulbs must be replanted as soon as they have been divided[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1]. This species is closely allied to *C. venustus*[90].

### 4.2.230 *Secale cereale ancestrale*

Rye  
 3 tin 7 cyuc 2 kcaak 0 tcan 0 dwat m hkuc  
 htut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Secale cereale ancestrale* is a ANNUAL. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

**kcakta Edible Parts:** Seed**Edible Uses:** Seed - cooked[105, 177]. It can be ground into a flour and used as a cereal in making bread, biscuits etc.

**tcanta** None known  
**dwatta** None known

**propta Seed** - sow March or October in situ and only just cover the seed. Germination should take place within 2 weeks.

**nwatta** We have very little information on this species and do not know if it will succeed in Britain, though it should succeed as a spring-sown annual and possibly as an autumn sown plant. It is a primitive form of the cultivated cereal rye, *Secale cereale*[177] and as such could be of value in breeding programmes. The following notes are based on the general needs of the genus. Succeeds in most soils but prefers a well-drained light soil in a sunny position.

### 4.2.231 *Calochortus aureus*

Mariposa Lily, Golden mariposa lily  
 3 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc  
 htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Calochortus aureus* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Root**Edible Uses:** Bulb - raw[44, 61, 105, 161]. The bulbs are gathered in early spring and peeled before being eaten[257]. Flowers[257]. No more details are given.

**tcanta** None known  
**dwatta** None known

**propta Seed** - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

**nwatta** Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry over winter[1, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1].

### 4.2.232 *Thymus pseudolanuginosus*

Woolly Thyme  
 3 tin 9 cyuc 2 kcaak 2 tcan 2 dwat 0.1 m hkuc  
 htut cyutli kyuctcup hwicli hrasljut hpa7tli priklwis hpa7tmwatli xre7t hjonli

**drutta** *Thymus pseudolanuginosus* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year; in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta** The leaves have a thyme scent and are used as a flavouring in food[238].

**tcanta** An essential oil is obtained from the leaves. Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wildfires, these are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level groundcovers provide little fuel.

**dwatta** The leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of



dwatta OdontalgicOdontalgic[74]. The root is used. propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Landscape Uses:Border, Container, Foundation, Ground cover, Seashore, Specimen. Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. A vigorous plant, forming medium to large clumps[200]. Hybridizes freely with other members of this genus[200]. Since this species produces its seed apomictically, it should breed true[200] (unless there is also cross pollination of course). Cultivated for its root (used medicinally) in China[74]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A number of named forms have been selected for their ornamental value[187]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers.

#### 4.2.227 *Prunella vulgaris*

Self-Heal, Common selfheal, Aleutian selfheal, Lance selfheal 3 tlin 7 cyuc 2 kcaok 0 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Prunella vulgaris* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: DrinkLeaves - raw or cooked[9]. They can be used in salads, soups, stews etc[183]. Somewhat bitter due to the presence of tannin in the leaves, though this can be removed by washing the leaves[177]. A cold water infusion of the freshly chopped or dried and powdered leaves is used as a refreshing beverage[161, 183]. Very tasty[168].

tcanta DyeAn olive-green dye is obtained from the flowers and stems[168]. The plant is a good ground-cover in sunny positions or light shade[200].

dwatta Alterative Antibacterial Antibiotic Antidiarrhoeal Antipyretic Antiseptic Antispasmodic Astringent Carminative Diuretic Febrifuge Hypotensive Stomachic Styptic Tonic Vermifuge VulnerarySelf heal has a long history of folk use, especially in the treatment of wounds, ulcers, sores etc[7]. It was also taken internally as a tea in the treatment of fevers, diarrhoea, sore mouth, internal bleeding etc[4, 222]. In Korea it is used to treat oedema, nephritis, scrofula and goitre[279]. The whole plant is alterative, antibacterial, antipyretic, antiseptic, antispasmodic, astringent, carminative,

diuretic, febrifuge, hypotensive, stomachic, styptic, tonic, vermifuge and vulnerary[4, 9, 13, 21, 176, 218]. It has an antibacterial action, inhibiting the growth of *Pseudomonas*, *Bacillus typhi*, *E. coli*, *Mycobacterium tuberculi* etc[176]. It can be used fresh or dried, for drying it is best harvested in mid-summer[4]. The plant is experimentally antibiotic and hypotensive[218, 222].

propta Seed - sow in mid spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed then it can be sown outdoors in situ in mid to late spring. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Thrives in any damp soil[1], in full sun or in light shade[238]. Plants are apt to become troublesome weeds in turf that is at all damp[1]. Self heal is a good plant for growing in the spring meadow[24].

#### 4.2.228 *Aquilegia coerulea*

Rocky Mountain Columbine, Colorado blue columbine, Daley's columbine, White Colorado columbine 3 tlin 7 cyuc 2 kcaok 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Aquilegia coerulea* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they have a sweet taste[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K].

tcanta Parasiticide ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveAntispasmodic, diaphoretic, parasiticide, resolvent, salve[172]. The seed was chewed, or an infusion of the root was used, to treat abdominal pains and general sickness[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sheltered sunny position[1]. It also succeeds in partial shade[187]. Intolerant of heavy clay soils[200]. A very ornamental plant, it is the state flower of Colorado[187, 270]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

#### 4.2.229 *Calochortus luteus*

Yellow Mariposa, Yellow mariposa lily 3 tlin 7 cyuc 2 kcaok 0 tcan 0 dwat 0.3 m hkuc htut cyutli hgatyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Calochortus luteus* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Experimental Crop Industrial Crop: Hydrocarbon Management: HayLandscape Uses:Border, Foundation, Massing. Prefers a well-drained light rich or peaty soil[1, 200]. Requires a moist soil and a sunny position, doing well by water[111, 134]. Succeeds on dry soils and on all soil types[112]. Plants are hardy to at least -25°C[187]. A very ornamental plant[1], the flowers are very attractive to butterflies[169]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. Special Features:Attractive foliage, North American native, Naturalizing, Wetlands plant, Attracts butterflies, Suitable for cut flowers, Fragrant flowers. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

#### 4.2.112 *Prunus cerasus frutescens*

Bush Sour Cherry 3 tlin 7 cyuc 3 kcaok 3 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta *Prunus cerasus frutescens* is a deciduous Tree growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Gum Gum Oil Oil TeaFruit - raw or cooked[1, 2, 5, 11, 12]. Neither bitter nor sweet, the fruit is pleasantly acid and can

be eaten out of hand, used in pies, preserves etc or dried for later use[183]. The fruit is about 10mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible oil is obtained from the seed[46, 61]. When refined it is used as a salad oil[183]. The leaves are used as a tea substitute[46, 61, 183]. A gum obtained from the trunk is used for chewing[61, 64].

tcanta Adhesive Dye Gum Gum Hedge Hedge Oil Oil WoodAn edible drying oil obtained from the seed is also used in cosmetics[61]. The gum obtained from the stem is also used as an adhesive[61, 64]. Plants can be grown as a hedge[50], succeeding in fairly exposed positions[K]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers during the dormant season. They can be planted out direct into their permanent positions.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Prefers an acid soil according to another report[5]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Hardy to about -20°C[184]. A shrub with a suckering habit, this subspecies has long been cultivated for its edible fruit, especially in Russia[11]. There are several named varieties[200] including 'Ostheim' which has been cultivated in Britain[11]. This subspecies has smaller fruits[200]. Most members of this genus are shallow-rooted[238]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2].

#### 4.2.113 *Ligusticum canbyi*

Osha 3 tlin 6 cyuc 3 kcaok 2 tcan 0 dwat 1.2 m hkuc pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Ligusticum canbyi* is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves Root Shoots StemEdible Uses: Leaves shoots and stems. A pleasant taste. The young leaves, shoots and stems can all be eaten. They have a strong celery flavour [1-2]. The root is chewed rather than eaten. Can be used as a culinary herb [1-2].

tcanta Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2].

dwatta None known propta Seed, Division.

nwatta A stout perennial herb from a thick taproot. The taproot is thick and fibrous. Prefers full shade and semi shade. Moist or wet soil. It grows in moist and wet stream banks. It grows at moderate and high elevations in Canada.

Elevation (metres) 560 to 2300. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

#### 4.2.114 *Viola labradorica*

Labrador Violet, Alpine violet, Johnny Jump-Up, Alpine Violet 3 tlin 8 cyuc 3 kcaak 2 tcan 0 dwat 0.1 m hkuc pcmhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikhpa7tmwatli xre7t hjonli

drutta *Viola labradorica* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaYoung leaves and flower buds - raw or cooked[105]. A mild flavour, though the leaves soon become quite tough[K]. The leaves make a very acceptable addition to salads[K]. When added to soup they thicken it in much the same way as okra[85, 159]. A tea can be made from the leaves[85].

tcanta A good ground cover plant, fast spreading but slow to thicken up and may need weeding for the first year or so[197]. Plants should be spaced about 30cm apart each way[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta None known  
propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Border,Ground cover, Rock garden, Woodland garden. Cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Succeeds in dense shade[197]. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5. Hardy to about -25°C[187]. There are some named varieties selected for their ornamental value[200]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. Special Features:Attractive foliage, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

#### 4.2.115 *Amaranthus retroflexus*

Pigweed, Redroot amaranth, Wild Beet 3 tlin 11 cyuc 3 kcaak 2 tcan 2 dwat 0.9 m hkuc htut cyutli hgattcup hwicli hrasljutnyik hpa7tli frusflatprikhwisslip hpa7tmwatli fyif hjonli

drutta *Amaranthus retroflexus* is a ANNUAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked as a spinach[2, 5, 62, 85, 159]. A mild flavour, it is often mixed with stronger flavoured leaves[183]. Very rich in iron, it is also a good source of vitamins A and C[201]. Seed - raw or cooked[2, 46, 61, 85]. Ground into a powder and used as a cereal substitute[5], it can also be sprouted and added to salads. The seed is very small, about 1mm in diameter[266], but easy to harvest and very nutritious. The flavour is greatly improved by roasting the seed before grinding it[183]. It is often added to maize meal[183]. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K].

tcanta Dye FodderYellow and green dyes can be obtained from the whole plant[168]. Like many other species of *Amaranthus*, this plant may be harmful and even deadly when fed to cattle and pigs in large amounts. However, when supplied in moderation, it is regarded as an exceptionally nutritious fodder.

dwatta AstringentA tea made from the leaves is astringent[222]. It is used in the treatment of profuse menstruation, intestinal bleeding, diarrhoea etc[222, 238, 257]. An infusion has been used to treat hoarseness[257].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. A good companion for potatoes, onions, corn, tomatoes, peppers and aubergines[20, 201]. A deep rooted plant, bringing up minerals from lower levels of the soil[201]. Formerly cultivated as a food crop by the N. American Indians[85]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

#### 4.2.116 *Asclepias speciosa*

Showy Milkweed 3 tlin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta *Asclepias speciosa* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from June to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil Root Seed S: Uses: Gum Oil SweetenerFlower buds - raw or cooked[61, 92]. They taste somewhat like peas[85]. They can be used to thicken soups[257]. Young shoots and leaves - cooked[46, 61, 62, 92, 95]. An asparagus substitute[85, 183]. One report says that they should not be eaten raw[85], whilst another says that the young spring shoots were eaten raw by some native American tribes[257]. Tips of older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long - raw or cooked[85, 257]. Very appetizing[85]. The immature pods

and conditions[200]. It grows well in heavy clay soils[17], though it prefers a light calcareous soil[1]. Dislikes dry soils[31]. This species succeeds even in dense shade, growing well under trees[31, 200]. Once established, it can also succeed in drought conditions under the shade of trees, providing there is plenty of humus in the soil[190]. There are at least four sub-species, *L. galeobdolon montanum* is the form generally found wild in Britain and it is a triploid. *L. galeobdolon luteum* and *L. galeobdolon flavidum* are both diploids[187]. *L. galeobdolon argentatum* is the more rampant form, its clone 'Variegatum' is a commonly used ground cover plant for shady places[187]. Plants seem to be immune to the predations of rabbits[233]. A very invasive plant, sending out long prostrate shoots that root at intervals along the stems[31, 200]. Special Features: Attractive foliage, Naturalizing. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

#### 4.2.224 *Aquilegia jonesii*

Columbine, Jones' columbine, Blue limestone columbine 3 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta *Aquilegia jonesii* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K].

tcanta Parasiticide ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveAntispasmodic, diaphoretic, parasiticide, resolvent, salve[172].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Prefers a well-drained friable sandy loam with leaf mold[1]. Intolerant of heavy clay[200]. A very ornamental plant[1]. This species deeply resents root disturbance and cannot be transplanted[60]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

#### 4.2.225 *Glechoma hederacea*

Ground Ivy, Field Balm, Gill Over The Ground, Runaway Robin

3 tlin 10 cyuc 2 kcaak 3 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli jlutnyikfrp hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta *Glechoma hederacea* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a fast rate. It is not frost tender. It is in leaf all year, in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Conditment TeaYoung leaves - raw or cooked[9]. The leaves have a bitter flavour[5], they can be mixed into salads to add a slight aromatic tang[7]. They can also be cooked like spinach, added to soups etc or used as a flavouring[2, 183]. Available very early in the year. A herb tea is made from the fresh or dried leaves[2, 177, 183]. It is often used mixed with verbena leaves[7]. The herb has been added to beer in much the same way as hops in order to clear it and also to improve its flavour and keeping qualities[4, 183]. This species was the most common flavouring in beer prior to the use of hops from the 16th century onwards[238].

tcanta MiscellanyA good ground cover plant for shady places. It is rather vigorous though and can swamp smaller plants[197].

dwatta Anodyne Antidiarrhoeal Antiphlogistic Antirheumatic Appetizer Astringent Digestive Diuretic Febrifuge Miscellany Pectoral Stimulant Tonic Vermifuge-Ground ivy is a safe and effective herb that is used to treat many problems involving the mucous membranes of the ear, nose, throat and digestive system[254]. A well-tolerated treatment it can be given to children to clear lingering catarrh and to treat chronic conditions such as glue ear and sinusitis[254]. Throat and chest problems, especially those due to excess catarrh, also benefit from this remedy[254]. The leaves and flowering stems are anodyne, antiphlogistic, appetizer, astringent, digestive, diuretic, febrifuge, pectoral, gently stimulant, tonic and vermifuge[4, 9, 21, 100, 147, 165, 178]. They are best harvested in May whilst still fresh[4], and are dried for later use[238]. The leaves are used in the treatment of hypersensitivity in children and are useful in the treatment of kidney diseases and indigestion[4, 9, 21, 100, 147, 165, 178]. Applied externally, the expressed juice speeds the healing of bruises and black eyes[4]. Use with caution[21].

propta Seed - we have no information for this species but suggest sowing the seed in situ as soon as it is ripe, or in the spring. Division in spring or autumn[188]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Ground cover. Prefers a heavy soil and dappled shade[17, 31]. Prefers a moist well-drained soil, succeeding in sun or shade[188]. A very invasive plant, spreading freely at the roots[1, 31, 238]. A good bee plant[108]. Special Features:Attractive foliage, Fragrant foliage, Not North American native, Naturalizing, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

#### 4.2.226 *Hosta ventricosa*

Blue plantain lily, Hosta 3 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta *Hosta ventricosa* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked. The white part of the stem is boiled[46, 61, 177].

tcanta A good ground cover plant[104], succeeding in dense shade but rather slow to spread[197]. Plants should be spaced about 60cm apart each way[208].

propta Seed - best sown in the autumn to winter in a cold frame so that it is stratified[80]. The seed can also be stored dry and sown in late winter. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Seedlings tolerate light shade for their first few years of growth. Cones often fall from the tree with their seed still inside[80]. If you have plenty of seed then it can be sown in an outdoor seedbed in early spring[80]. Grow the plants on for at least two years in the seedbed before planting them out in late autumn or early spring.

nwatta Landscape Uses:Christmas tree, Firewood, Aggressive surface roots possible, Screen, Specimen. Prefers a moist but not water-logged alluvial soil[1]. Dislikes calcareous soils[1]. Trees are a failure on dry hungry soils.[11]. Whilst they are moderately wind resistant[166], tall specimens are likely to lose their crowns once they are more than 30 metres tall in all but the most sheltered areas[185]. A very ornamental tree[1], it is the most cultivated timber tree in the world and is extensively used for re-afforestation in Britain[200]. There are several named varieties selected for their ornamental value[188]. Trees can be established in light shade but this must be removed in the first few years or growth will suffer[185]. Very slow growing for its first few years, growth soon becomes extremely fast with new shoots of up to 1.2 metres a year[185]. This annual increase can be maintained for many years[185]. Trees in sheltered Scottish valleys have reached 55 metres in 100 years[200]. New growth takes place from May to July[185]. The trees require abundant rainfall for good growth[11, 49]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Trees are very long-lived, specimens over 1,000 years old are known[226]. Seed production commences when trees are about 10 years old, though good production takes another 15 - 20 years[229]. Good crops are produced about every 6 years[229]. This tree is a pioneer species because it cannot reproduce under its own canopy[226]. The bark on mature trees can be 30cm thick, and this insulates the trunks from the heat of forest fires[213]. This species is notably resistant to honey fungus[81, 200]. Young growth can be damaged by late frosts[81]. The leaves have a strong sweet fruity aroma[185]. Special Features: North American native, Inconspicuous flowers or blooms.

## 4.2.221 Zizia aurea

Golden Alexanders, Golden zizia

3 tin 7 cyuc 2 kcaok 0 tcan 1 dwat 0.8 m hkuu htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Zizia aurea is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: The flowers, with the main stem removed, are a welcome addition to a tossed green salad. They are also a delicious cooked vegetable when used in a similar manner to broccoli[183].

tcanta None known

dwatta Febrifuge Hypnotic VulneraryA tea made from the root is febrifuge[222, 257]. The root is also believed to be vulnerary and hypnotic[222].

propta Seed - we have no information for this species but it is probably best sown in spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Requires a moist soil and a position in full sun[200]. Suitable for the wild garden and other informal plantings as well as collections of native wild flowers[200].

For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2].

## 4.2.222 Potentilla multifida

3 tin 7 cyuc 2 kcaok 0 tcan 0 dwat m hkuu hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Potentilla multifida is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[61]. Starchy[105, 177].

tcanta None known

dwatta None known

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.223 Lamium galeobdolon

Yellow Archangel

3 tin 9 cyuc 2 kcaok 3 tcan 1 dwat 0.3 m hkuu pcmhmimhtut cyutli hgattcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Lamium galeobdolon is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young leaves and shoots - cooked[183]. Young flowering tips - cooked.

tcanta A good ground cover plant, spreading rapidly by means of its rooting stems and succeeding even in dense shade. It is very vigorous, however, and can smother small plants[31, 197, 200]. It does very well in woodlands[K].

dwatta Antispasmodic Astringent Diuretic Expectoant Styptic VasoconstrictorThe herb is antispasmodic, astringent, diuretic, expectoant, styptic and vasoconstrictor[4].

propta Seed - usually self sows freely and should not require human intervention. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in situ as soon as it is ripe. Division in spring. Succeeds at almost any time in the growing season. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Ground cover, Massing, Woodland garden. A very easily grown plant, it tolerates most soils

are peeled before being eaten[257]. Flower clusters can be boiled down to make a sugary syrup[85] or they can be eaten raw[161, 183]. Seed - raw[161, 257]. A chewing gum can be made from the latex contained in the stem and leaves[46, 61, 92, 183]. Root[183]. No further details are given, but another report says that the root can be poisonous in large quantities[257].

tcanta Dye Fibre Gum Latex Oil Paper Pollution StuffingA good quality tough fibre is obtained from the bark[92, 99]. It is used in twine, coarse cloth, paper etc[92, 99]. The fibre is 10 - 45mm long[189]. It is easily harvested in late autumn, after the plants have died down, by simply pulling it off the dead stems[168, 169]. When making paper, the stems can be retted by leaving them in the ground until they are dry in the winter or they can be harvested in late summer, the leaves removed and the stems steamed to remove the fibre[189]. The stems are then cooked for two hours with lye and pounded with mallets[189]. The paper colour varies from white to creamy green depending on how the paper is made[189]. If the stems are used in the summer the latex will often find its way onto the fibres and is hard to remove[189]. The seed floss is used to stuff pillows etc, or is mixed with other fibres to make cloth[168, 169]. It has also been used as a baby's nappy[257]. The seed floss is a Kapok substitute, used in Life Jackets or as a stuffing material[169]. It is very water repellent. The floss has also been used to mop up oil spills at sea. Rubber can be made from latex contained in the leaves and the stems[57, 92, 112]. The yield is up to 3%[112]. Pods contain an oil and a wax which are of potential importance. A green dye is obtained from the flowers and leaves combined[168]. *Asclepias speciosa* is a specific Monarch butterfly food and habitat plant. The dogbane-milkweed family *Asclepias*, *Apocynum*, *Calotropis*, and *Traichomium* spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed finer or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

dwatta Antirheumatic Antiseptic Ophthalmic Skin Stomachic VD WartsThe latex is used as a cure for warts[168, 257]. The latex needs to be applied at least once a day of a period of some weeks for it to be effective[K]. The latex has antiseptic properties and has been used to treat skin sores, cuts and ringworm[257]. A decoction of the plant tops can be strained and used to treat blindness and snow-blindness[257]. The root is either chewed when fresh, or dried, ground into a powder then boiled, and used in the treatment of stomach ache[257]. A decoction of the roots has been used in small doses to treat venereal diseases and also to treat coughs, especially from TB[257]. A poultice of the mashed roots has been applied to rheumatic joints[257]. Some caution should be employed when using the root since there is a report that it can be poisonous in large quantities[257].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°c[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Experimental Crop Industrial Crop: Hydrocarbon Management: HayPrefers a well-drained light rich or

peaty soil and a sunny position[1, 134, 200]. A very ornamental plant[1], it is closely related to *A. purpurascens*[200]. The roots can spread quite freely when the plant is in a suitable position[233]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

## 4.2.117 Campanula carpatica turbinata

3 tin 7 cyuc 3 kcaok 2 tcan 0 dwat 0.3 m hkuu htut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula carpatica turbinata is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. A pleasant sweet flavour, but the leaves are a bit hairy[K]. Flowers - raw or cooked. Slightly sweet, they make a very pleasant and decorative addition to the salad bowl[K].

tcanta Plants make a good ground cover when planted about 30cm apart each way, forming a spreading clump[208].

dwatta None known

propta Seed - surface sow spring in a cold frame. Seed usually germinates in 2 - 4 weeks at 18°c. Very easy from seed[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. A very easy species to grow, it will tolerate almost any soil or situation though it prefers the fullest amount of sun[221]. Plants are hardy to at least -15°c[200]. This is a smaller growing geographic form of the species[208]. A very free-flowering plant, indeed it has one of the longest flowering periods of any species in this genus[271]. If the plant is cut back as the flowers fade, it will usually produce a second flush of flowers later in the season[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. This species, however, especially under garden conditions, is more likely to produce hybrids than most other members of the genus[271]. The plants are self-fertile[221]. There are several named varieties selected for their ornamental value[200]. 'Wheatley Violet' has somewhat hairy leaves with a pleasant sweetness[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.118 Campanula carpatica

Tussock Bellflower, Carpathian Bellflower, Carpathian Harebell

3 tin 8 cyuc 3 kcaok 2 tcan 0 dwat 0.3 m hkuu hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula carpatica is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. A pleasant flavour, they are slightly sweet but a little bit chevy when eaten raw[K]. Flowers - raw or cooked. Slightly sweet, they make a pleasant and decorative addition to salads[K].

tcanta Plants make a good ground cover when planted about 30cm apart each way, forming a spreading clump[208].

dwatta None known

propta Seed - surface sow spring in a cold frame. Seed usually germinates in 2 - 4 weeks at 18°C. Very easy from seed[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden. Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in a sunny position though it also tolerates partial shade[1, 200, 208]. A very easy species to grow, it will tolerate almost any soil or situation though it prefers the fullest amount of sun[221]. Plants grow well on a sunny wall so long as the roots have soil to grow into[219]. Plants are hardy to at least -15°C[200]. A very free-flowering plant, indeed it has one of the longest flowering periods of any species in this genus[271]. If the plant is cut back as the flowers fade, it will usually produce a second flush of flowers later in the season[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. This species, however, especially under garden conditions, is more likely to produce hybrids than most other members of the genus[271]. The plants are self-fertile[221]. A very variable species in the wild[271]. There are many named varieties selected for their ornamental value[200]. 'Chewton Joy' has pleasantly flavoured leaves[K]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Not North American native, Suitable for cut flowers. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 4.2.119 Viola canadensis

Canada Violet, Canadian white violet, Creepingroot violet 3 tlin 8 cyuc 3 kcaak 2 tcan 1 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Viola canadensis is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaY-oung leaves and flower buds - raw or cooked[62, 177, 183]. A very mild flavour, when boiled as greens they are best mixed with other stronger tasting leaves[183]. When added to soup they thicken it in much the same way as okra[62, 85, 159]. Flowers - raw[62, 85]. The leaves are a good tea substitute[62, 85, 183].

tcanta A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Emetic PouliticeA tea made from the roots has been used in the treatment of pain in the bladder region[222, 257]. The roots and leaves have traditionally been used to induce vomiting, they have also been poulticed and applied to skin abrasions and boils[222].

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Easily grown in any fertile soil in full sun or partial shade[233]. Prefers a cool position[233] in a moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5. Hardy to about -25°C[187]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. This species has mainly white flowers that are at first yellowish at the base then turn violet[222]. There are some named varieties selected for their ornamental value[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.120 Geum rivale

Water Avens, Purple avens

3 tlin 7 cyuc 3 kcaak 1 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Geum rivale is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to September, and the seeds ripen from June to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: Chocolate Condiment DrinkThe dried or fresh root can be boiled in water to make a delicious chocolate-like drink[85, 95, 106, 183, 213]. It can also be used as a seasoning[102, 183]. It is best harvested in the spring or autumn but can be used all year round[213]. Fragrant[161], it was once used to flavour ales[2, 183].

tcanta RepellentThe dried root repels moths. Plants are suitable for ground cover when spaced about 30cm apart each way[208]. The cultivar 'Leonard's Variety' is the best for this purpose[208].

The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[61]. A watery flavour; it is mainly used for making drinks, pies, preserves etc[183]. The Inuit dry or freeze them for winter use[183]. The fruit is about 4mm in diameter[200]. A tea can be made from the twigs[183].

tcanta Plants can be used for groundcover in exposed locations[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be very slow to germinate, stored seed requires 5 months warm then 3 months cold stratification at 5°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 3cm with a heel, July/August in a frame. Takes 3 weeks. Good percentage[78, 200]. Cuttings of mature wood of the current year's growth, 3cm with a heel, October in a frame. Requires shade. Good percentage[78, 200].

nwatta Landscape Uses:Erosion control, Foundation, Ground cover, Massing, Rock garden. A calcifuge plant, it is easily grown in a moist lime-free peaty soil[11, 182, 200]. Unlike most members of this genus, this species is hermaphrodite and self-fertile[183]. There has been some confusion over the name of this plant. Some authorities refer to it as E. hermaphroditum and others include it in E. nigrum or E. eamesii[200]. Special Features: Attractive foliage, North American native, Inconspicuous flowers or blooms.

### 4.2.219 Aquilegia flabellata

Fan Columbine, Dwarf Columbine

3 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aquilegia flabellata is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaLeaves - cooked. They must be thoroughly boiled[177]. Caution is advised, see the notes above on toxicity. Flowers - raw. Sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K]. The flowers are also used as a tea substitute.

tcanta ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta ParasiticideNone known

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Landscape Uses:Alpine garden, Container, Rock garden, Seashore. Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. Hardy to about -20°C[187]. The name of this species is based on the cultivated form, the true wild form is A. flabellata pumila. Kudo. There are some named varieties selected for their ornamental value[200]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be

immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features: Attracts birds, Attractive foliage.

### 4.2.220 Pseudotsuga menziesii

Douglas Fir, Rocky Mountain Douglas-fir

3 tlin 6 cyuc 2 kcaak 0 tcan 2 dwat m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Pseudotsuga menziesii is an evergreen Tree growing to 75 m (246ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from March to May, and the seeds ripen from September to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark MannaEdible Uses: Coffee Condiment Gum TeaYoung shoot tips - used as a flavouring in cooked foods[15, 177]. A subtle woody flavour[183]. A refreshing tea is made from the young leaves and twigs[14, 46, 177, 257]. Rich in vitamin C[183]. It is used as a coffee substitute according to some reports[92, 95, 161, 257]. The fresh leaves have a pleasant balsamic odour and are used as a coffee substitute[213]. Inner bark - dried, ground into a meal and mixed with cereals for making bread etc[161, 213]. A famine food used when all else fails[177]. A sweet manna-like substance is exuded from the bark[177, 183]. This report possibly refers to the resin that is obtained from the trunk[K], and is used as a chewing gum by various native North American Indian tribes[226]. Alternatively, the report could be referring to the sap which is used as a sugar-like food[257].

tcanta Basketry Cork Dye Fertilizer Fuel Gum Insecticide Resin Shelterbelt Tannin WoodA light brown dye is obtained from the bark[118, 257]. The bark is a source of tannins[46, 82]. The bark can be used as a cork substitute[171] and is also used to make fertilizer[226]. The bark contains pitch, it burns with a lot of heat and almost no smoke, so it is prized as a fuel[226, 257]. The small roots have been used to make baskets[257]. The plant has insecticidal properties[171]. A resin is obtained from the trunk, similar to Abies balsamea[61, 64] which is used in the manufacture of glues, candles, as a cement for microscopes and slides and also as a fixative in soaps and perfumery[171]. The resin can also be used as a caulking material on boats[257]. A fast growing and fairly wind-resistant tree, it is often used in shelterbelt plantings[185]. Wood - heavy, strong, fine grained, durable, though it can be of variable quality. It dries quickly, does not warp and is easily worked, it is used for heavy construction, telegraph poles, furniture etc[21, 46, 61, 82, 99, 171, 200, 226]. It is also used as a good quality fuel[46, 99, 257].

dwatta Antirheumatic Antiseptic Kidney Mouthwash Poulitice Skin Vitamin CDouglas fir was often employed medicinally by various native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. An antiseptic resin is obtained from the trunk. It is used as a poultice to treat cuts, burns, wounds and other skin ailments[226, 257]. The poultice is also used to treat injured or dislocated bones[257]. The resin is used in the treatment of coughs and can be chewed as a treatment for sore throats[257]. An infusion of the green bark has been used in the treatment of excessive menstruation, bleeding bowels and stomach problems[257]. An infusion of the leaves has been used as a wash and a sweat bath for rheumatic and paralyzed joints[257]. An infusion of the young sprouts has been used in the treatment of colds[257]. An infusion of the twigs or shoots has been used in the treatment of kidney and bladder problems[257]. A decoction of the buds has been used in the treatment of venereal diseases[257]. Young shoots have been placed in the tips of shoes to keep the feet from perspiring and to prevent athletes foot[257]. A mouthwash is made by soaking the shoots in cold water[15].

pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Dryopteris expansa* is a FERN growing to 0.4 m (1ft 4in) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 3. The seeds ripen from July to September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kaakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[256]. Baked and then peeled before being eaten[257]. The raw root is rather bitter but they develop a sweet taste when cooked and are said by some people to develop a flavour rather like sweet potatoes[256]. The root is best harvested in early autumn. At this time the rhizomes are surrounded by scaly, finger-like projections - if the projections are flat and dark inside then the rhizomes are not good to eat but if they are round, fleshy and light-coloured then they can be eaten[256]. The young shoots, harvested in spring before they have fully unfurled, can be cooked and eaten[257]. They can be added to soups[257].

tcanta HairAn infusion of the leaves has been used as a hair wash[257].

dwatta Anthelmintic PoulticeA poultice of the pounded roots has been applied to cuts[257]. We have no other reports for this species, but the following uses apply to many members of this genus and quite probably also to this species[K]. The root contains 'filicin', a substance that paralyzes tapeworms and other internal parasites and has been used as a worm expellent[4, 172, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. The root is also used in the treatment of dandruff[4, 172].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant[233], it prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Prefers a moist soil[188]. Closely related to *D. dilatata* and hybridising where their ranges meet to produce *D. x ambroseae*. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.216 *Filipendula vulgaris*

Dropwort, Meadowsweet

3 tin 10 cyuc 2 kcaak 0 tcan 1 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hrasljutnyikfrip hpa7tli prik-wisslip hpa7tmwatli fyifxre7t hjonli

drutta *Filipendula vulgaris* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kaakta Edible Parts: Leaves RootEdible Uses: Young leaves - raw or cooked[61, 177, 200]. They can be added to salads and soups[183]. Root - raw or cooked[61, 115, 177, 200]. Rather bitter[5]. Astringent[100]. Best if roasted[141]. A famine food, it is only used in times of scarcity[183].

tcanta Plants can be used as a ground cover when planted about 45cm apart each way[208]. The cultivar 'Flore Pleno' with sweetly scented double flowers has been recommended[208].

dwatta Anthelmintic Antispasmodic Epilepsy LithotropicThe root is anthelmintic and lithotropic. It is used in the treatment of epilepsy, kidney and bladder stones, genital discharges and intestinal worms[61].

propta Seed - best sown in the autumn in a cold frame[1]. The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Massing, Rock garden. Prefers a well-drained moisture retentive soil[200]. Dislikes shade[17]. Tolerates dry soils[200]. Grows well on calcareous soils[17]. The flowers are sweetly scented and are very attractive to bees[245]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Naturalizing, Suitable for cut flowers.

### 4.2.217 *Empetrum eamesii*

Rockberry, Purple crowberry

3 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Empetrum eamesii* is an evergreen Shrub growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177, 200]. The fruit is about 4mm in diameter[200].

tcanta Succeeds as a ground cover plant in exposed positions[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be very slow to germinate, stored seed requires 5 months warm then 3 months cold stratification at 5°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 3cm with a heel, July/August in a frame. Takes 3 weeks. Good percentage[78, 200]. Cuttings of mature wood of the current year's growth, 3cm with a heel, October in a frame. Requires shade. Good percentage[78, 200].

nwatta Landscape Uses:Erosion control, Foundation, Ground cover, Massing, Rock garden. A calcifuge plant, it is easily grown in a lime-free soil[200]. Prefers a moist sandy peaty soil and some shade[1, 3]. The flowers of this species are usually hermaphrodite, but some female flowers are produced[200]. Special Features:Attractive foliage, North American native, Inconspicuous flowers or blooms.

### 4.2.218 *Empetrum eamesii hermaphrotum*

Mountain Crowberry, Rockberry

3 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprik hpa7tmwatli fyifxre7t hjonli

drutta *Empetrum eamesii hermaphrotum* is an evergreen Shrub growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower in March. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies).

dwatta Antidiarrhoeal Antiinflammatory Antiseptic Aromatic Astringent Diaphoretic Febrifuge Stomachic Styptic TonicThe root is anti-inflammatory, antiseptic, aromatic, astringent, diaphoretic, febrifuge, stomachic, styptic and tonic[4, 21]. An infusion is taken internally in the treatment of diarrhoea (and is suitable for children to use), intestinal and stomach complaints, liver disorders etc, it is also applied externally as a wash to various skin affections - it is said to remove spots, freckles and eruptions from the face[4, 9]. This plant has similar properties but is less active than the related *G. urbanum* and so is seldom used medicinally[9, 238]. The root is best harvested in the spring, since at this time it is most fragrant[4]. Much of the fragrance can be lost on drying, so the root should be dried with great care then stored in a cool dry place in an airtight container, being sliced and powdered only when required for use[4]. The root is rich in tannin and is a powerful astringent[213, 222].

propta Seed - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer' Division in spring or autumn. This should be done every 3 - 4 years in order to maintain the vigour of the plant[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any moderately good garden soil that is well-drained[1]. Easily grown in a moist or shady border[28, 187]. Prefers a soil rich in organic matter[200]. Prefers a base rich soil[17]. Hybridizes freely with other members of this genus, especially with *G. urbanum*[187]. There are some named varieties selected for their ornamental value[208, 233]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.121 *Vaccinium vitis*

Cowberry, Lingonberry, Northern mountain cranberry, Cranberry

3 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli fyifxre7t hjonli

drutta *Vaccinium vitis-idaea* is an evergreen Shrub growing to 0.3 m (1ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5. It is in leaf all year, in flower from May to June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[2, 3, 5, 9, 21, 257]. Quite pleasant to eat[7]. An acid flavour, they are used like cranberries in preserves and are considered by many people to be superior to cranberries[183]. The taste is better after a frost[62, 115, 172]. Occasionally the plants bear 2 crops in a year[13]. The fruit is about 6mm in diameter[200]. A tea is made from the leaves[177, 183]. This should not be drunk on a regular basis because it contains the toxin 'arbutin'[9].

tcanta DyeA yellow dye is obtained from the leaves and stems[172]. A purple dye is obtained from the fruit[207]. Can be grown as a ground cover plant[11], spreading by underground runners[188]. It needs weeding for the first year

or so[197]. Plants are best spaced about 30cm apart each way[208].

dwatta Antirheumatic Antiseptic Astringent Diuretic Refrigerant VDThe leaves are antiseptic, astringent, diuretic, refrigerant[7, 21]. They are used in the treatment of gonorrhoea[218], arthritis, rheumatism, diabetes and diarrhoea[9]. The leaves are gathered in early summer and dried for later use[7]. The mature fruits are eaten fresh or dried as a remedy for diarrhoea[9] and as a treatment for sore throats, coughs and colds[257]. The juice has been gargled as a treatment for sore throats[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Landscape Uses:Border, Massing, Seashore. Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Sometimes cultivated for its edible fruit, there are some named varieties[183]. 'Koralle' has large and conspicuous berries[182]. The fruit hangs on the plant all winter if it is not picked[183]. The flowers produce a great deal of nectar and are very attractive to bees[7]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Edible, Wetlands plant, Attractive flowers or blooms. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 4.2.122 *Galium verum*

Lady's Bedstraw, Yellow Spring bedstraw, Wirtgen's bedstraw

3 tin 7 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flat-prikklwis hpa7tmwatli fyifxre7t hjonli

drutta *Galium verum* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kaakta Edible Parts: Leaves SeedEdible Uses: Coffee Colouring Curdling agent DrinkLeaves - raw or cooked[62, 179]. A yellow dye from the flowering stems

is used as a food colouring[105, 183]. The roasted seed is a coffee substitute[7]. The seed is also said to be edible[179]. The chopped up plant can be used as a rennet to coagulate plant milks[7, 67, 115, 183, 244]. The flowering tops are distilled in water to make a refreshing acid beverage[2, 183].

tcanta Dye Repellent Strewing StuffingA red dye is obtained from the root[4, 6, 7, 67, 115]. It is rather fiddly to utilize[169]. A yellow dye is obtained from the flowering tops[4, 7, 115]. The dye is obtained from the foliage when it is boiled with alum[207]. The dried plant has the scent of newly mown hay, it was formerly used as a strewing herb[24] and for stuffing mattresses etc[61, 67, 115]. It is said to keep fleas away[207]. A sprig in a shoe is said to prevent blisters[67].

dwatta Antispasmodic Astringent Diuretic Epilepsy Foot care Lithontripic Urinary VulneryLady's bedstraw has a long history of use as a herbal medicine, though it is little used in modern medicine. Its main application is as a diuretic and as a treatment for skin complaints[254]. The leaves, stems and flowering shoots are antispasmodic, astringent, diuretic, foot care, lithontripic and vulnery[4, 7, 9]. The plant is used as a remedy in gravel, stone or urinary disorders[4, 9, 53, 238] and is believed to be a remedy for epilepsy[4, 21]. A powder made from the fresh plant is used to soothe reddened skin and reduce inflammation[7] whilst the plant is also used as a poultice on cuts, skin infections, slow-healing wounds etc[9]. The plant is harvested as it comes into flower and is dried for later use[9]. Both Asperuloside (a terpenoid) and Coumarin (a benzopyrone) occur in some species of Galium. Asperuloside can be converted into prostaglandins (hormone-like compounds that stimulate the uterus and affect blood vessels), making the genus of great interest to the pharmaceutical industry[238].

propta Seed - best sown in situ as soon as it is ripe in late summer[200]. The seed can also be sown in situ in the spring though it may be very slow to germinate[200]. Division in spring. The plant can be successfully divided throughout the growing season if the divisions are kept moist until they are established[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a loose moist leafy soil in some shade, but it tolerates a position in full sun[14]. Plants are tolerant of dry soils[1], but do not thrive in a hot climate. They dislike very acid soils[17, 53]. A very invasive plant[1], though it is low-growing and mixes without harm with any plants at least 60cm tall[K]. It grows well in the summer meadow[24] and is a food plant for the larvae of several species of butterflies[30].

## 4.2.123 Campanula alliariifolia

Cornish Bellflower

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.7 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli priklwiv hpa7tmwatli fyifxre7t hjonli

drutta Campanula alliariifolia is a deciduous Perennial growing to 0.7 m (2ft 4in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from April to November, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[K]. The leaves are rather hairy and, especially as they age, have a slightly unpleasant bitterness. They are acceptable as a minor ingredient in mixed salads, but are generally less than pleasant to eat on their own[K]. Flowers - a pleasant taste and texture with a slight sweetness[208].

tcanta Plants can be grown for ground cover when planted about 45cm apart each way, they form spreading clumps[208].

dwatta None known

propta Seed - surface sow spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. The plant has a thick fleshy root with a number of crowns. Whilst this can be divided if great care is taken not to damage the root, it is not really recommended because the divisions take a long time to become established[221].

nwatta Succeeds in any well-drained fertile soil[233], but prefers a moist well-drained rich sandy loam and a neutral or alkaline soil in full sun, though it also tolerates partial shade[1, 200, 208]. When grown in exposed and windy positions, plants tend to grow better when in a poor soil[271]. Plants are hardy to at least -15°C[200]. If the plant is cut back as the flowers fade, it will usually produce a second flush of flowers later in the season[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. This species tends to produce seed abundantly in cultivation and will often self-sow[221, 271]. Plants can be naturalized in the light dappled shade of a woodland[200]. There are some named forms selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.124 Campanula portenschlagiana

Adria Bellflower

3 tlin 7 cyuc 3 kcaak 3 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli priklwiv hpa7tmwatli fyifxre7t hjonli

drutta Campanula portenschlagiana is an evergreen Perennial growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[K]. The leaves are rather small, but they are produced all year round[K]. They have a mild flavour and make an acceptable ingredient in mixed salads, especially in the winter, but we find that, eaten in quantity, they become a bit unpleasant[K]. Flowers - raw. Very freely produced, they have a pleasant flavour and make a very decorative addition to salads[K].

tcanta A rampantly spreading plant, suitable for ground cover in a sunny position[197, 208].

dwatta None known

propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy, the plant can be divided at almost any time of the year[221].

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil preferring full sun but also succeeding in partial shade[1, 200, 208]. This species prefers a slightly shaded position[221]. Plants can be grown on a dry

very ornamental plant, it is hardy to about -20°C[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants seem to be immune to the predations of rabbits[233]. The different species of this genus will hybridise freely when grown near each other[233].

## 4.2.213 Calochortus venustus

Butterfly Mariposa Lily

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli kyuctuc hwicli hrasjlut hpa7tli flatpriklwiv hpa7tmwatli xre7t hjonli

drutta Calochortus venustus is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - cooked[94, 105, 257]. A sweet flavour[161].

tcanta None known

dwatta None known

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful for spring-sown seed, though this species usually germinates within two months without any treatment[120]. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbs, harvested from the stems after flowering. Can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept rather dry from when the bulb flowers until late winter[1, 90, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1, 90]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. It should not be crowded by other plants[214]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that they should be replanted immediately[1]. Bulbs frequently divide after flowering, the bulbets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1].

## 4.2.214 Epigaea repens

Mayflower, Trailing arbutus, Ground Laurel

3 tlin 8 cyuc 2 kcaak 2 tcan 2 dwat 0.1 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Epigaea repens is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Flowers - raw. Fragrant, with a spicy slightly acid flavour[105], they are eaten as a wayside nibble or are added to salads[183]. Thirst quenching[177].

tcanta Plants can be grown for ground cover, they should be spaced about 25cm apart each way and form a carpet of growth[208]. This species is probably not very worthwhile for ground cover in Britain because of its difficulty to cultivate[208].

dwatta Astringent Diuretic Tonic UrinaryMayflower is rarely used medicinally, even in folk medicine, though it is a strong urinary antiseptic and is one of the most effective remedies for cystitis, urethritis, prostatitis, bladder stones and particularly acute catarrhal cystitis[268]. The leaves are astringent, diuretic and tonic[46, 61]. An infusion is made from the dried leaves, or a tincture from the fresh leaves[4]. A tea made from the leaves is used in the treatment of kidney disorders, stomach aches, bladder disorders etc[222]. It is of special value when the urine contains blood or pus[4]. Use with caution, the plant contains arbutin and, although this is an effective urinary disinfectant, it hydrolyzes to hydroquinone which is toxic[222]. The leaves can be used fresh or can be harvested in the summer and dried for later use[238, 268].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[200]. Another report says that the seed requires no pre-treatment and can be sown in late winter in a cold frame[113]. Surface sow and place the pot in light shade, do not allow it to dry out[113]. The seed usually germinates in 3 - 5 weeks[113]. As soon as they are large enough to handle, pot up the seedlings into individual pots. Be very careful since they strongly resent root disturbance. Grow them on in light shade in the greenhouse and plant them out in their permanent positions in the late spring of their second years growth. Cuttings of half-ripe wood, July/August in a frame[200]. Take the cutting with a part of the previous year's growth[113]. (This report is unclear as to whether it means a heel of older wood or just a small section of older wood[K]) Plants self-layer and can be divided in the spring but this must be done with great care since they deeply resent root disturbance[200].

nwatta Landscape Uses:Rock garden, Woodland garden. Requires an open lime-free humus-rich soil and shade from direct sunlight[11, 182, 200]. Grows well in the shade of other calcifuge plants such as rhododendrons and also under pine trees[245]. A very cold-hardy plant but it is often excited into premature growth by mild winter weather and is then subject to damage by frost[11]. The flower buds require a period of chilling to about 2°C before they will open[200]. The flowers are deliciously and strongly scented[200] with a rich spicy perfume[245]. There are some named varieties, selected for their ornamental value[200]. A difficult plant to grow in cultivation[200] and very hard to transplant successfully[182]. Another report says that although the genus is generally difficult to cultivate, this species is relatively easy to grow[188]. Special Features:Attractive foliage, Fragrant flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 4.2.215 Dryopteris expansa

Spiny Wood Fern, Spreading woodfern  
3 tlin 7 cyuc 2 kcaak 0 tcan 3 dwat 0.4 m hkuc



18, 20]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. Dynamic accumulator.

dwatta Anodyne Antiseptic Antispasmodic Carminative Chologogue Diaphoretic Refrigerant Stomachic Tonic VasodilatorEau de Cologne mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. The leaves and flowering plant are anodyne, antiseptic, antispasmodic, carminative, chologogue, diaphoretic, refrigerant, stomachic, tonic, vasodilator[4, 9, 21, 165]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The medicinal uses of this herb are more akin to lavender (*Lavandula* spp) than the mints. It is used to treat infertility, rapid heartbeat, nervous exhaustion etc[238]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta A very easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for the production of essential oils, but the plant also succeeds in partial shade. Prefers a slightly acid soil[16]. Plants are very tolerant of neglect, succeeding in long grass[K]. Hybridizes freely with other members of this genus. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. The flowers are very attractive to bees and butterflies[24]. A good companion for growing near cabbages and tomatoes, helping to keep them free of insect pests[14, 20]. The mint will need to be grown in containers to prevent it spreading too aggressively into the other plants. The whole plant has a strong minty aroma with a hint of ginger[245]. The plant produces a better quality essential oil if the plant is grown in dry ground[115]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 4.2.211 *Lewisia pygmaea*

Pigmy Bitterroot, Alpine lewisia

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc htuc cyutli tcup hwicli hrasjutli hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Lewisia pygmaea* is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf from September to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy)

soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - cooked. Steeped and boiled[177]. It can also be dried for later use[257]. The root is said to be extremely nutritious[85], though some native North American Indian tribes believed that eating it could cause insanity[257]. It is easiest to use when the plant is in flower because the outer layer of the root (which is very bitter) slips off easily at this time of the year[85]. The root has a good taste though a decided bitter flavour develops afterwards[105, 161].

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame in a very freely draining soil[129]. Sow stored seed as soon as possible in a cold frame. One month cold stratification should improve germination, though this is still likely to be very slow. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first two winters. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March/April. Very difficult.

nwatta Requires a very well-drained gritty humus-rich deep soil in a sunny position[1, 200]. Prefers a neutral to acid soil[188]. This species is not reliably hardy in Britain. It can withstand consistently very cold weather but does not like alternating periods of mild and cold conditions, nor does it like winter wet[1]. The plant is very susceptible to rotting at the neck in a damp soil[200]. Plants die down after flowering and start growing again in the autumn[188]. A very ornamental plant[1]. Polymorphic[60]. Very apt to hybridize with other members of this genus[1].

### 4.2.212 *Bergenia crassifolia*

Siberian Tea

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmhmimhtuc cyutli hgattcup hwicli hrasjutnykrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Bergenia crassifolia* is an evergreen Perennial growing to 0.3 m (1ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from March to April. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea substitute[2, 61, 105, 177, 183].

tcanta TanninA useful ground cover plant[188], though rather slow to spread[197]. It forms a clump[208]. Tannin is obtained from the bark[61]. The roots contain 15 - 22% tannin, exceptionally 26%[223]. The leaves and stems contain 17 - 25% tannin[223].

dwatta Antidiarrhoeal Antirheumatic TBNone known propta Seed - surface sow in a greenhouse. Make sure that the compost does not dry out. Two weeks cold stratification can speed up germination which usually takes 1 - 6 months at 15°C[134]. Fresh seed, sown as soon as it is ripe in late spring is liable to germinate better than stored seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in late spring after flowering[188] or in autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in full sun or light shade in most soils[134, 200] but prefers a deep fertile soil that does not dry out fully[134]. Established plants are drought tolerant according to another report[190]. Grows well in heavy clay soils. Plants are at their best in a medium-heavy soil[208]. Requires a position sheltered from cold drying winds and from the early morning sun. The leaf colour is best when plants are grown in a poor soil in a sunny position[188]. A

stone wall[200] and succeed in poor soils[221]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. A rampant plant, capable of spreading widely when in suitable conditions by means of both underground roots and long stems above ground [188, 271]. It makes a good ground cover but can become a nuisance if it is not sited with care[200]. It is, however, fairly easy to control by simply pulling up any parts of the plant that wander too far[271]. There are several named forms selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

### 4.2.125 *Mentha x piperita officinalis*

White Peppermint

3 tlin 7 cyuc 3 kcaak 3 tcan 5 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjutnykrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Mentha x piperita officinalis* is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. A mild peppermint flavour, they are used as a flavouring in salads or cooked foods[183]. An essential oil from the leaves and flowers is used as a flavouring in sweets, chewing gum, ice cream etc[183]. A herb tea is made from the fresh or dried leaves[183].

tcanta Essential Repellent StrewingAn essential oil obtained from the whole plant is used in perfumery[46, 105]. It is also an ingredient of oral hygiene preparations, toiletries etc[238]. Peppermint leaves are used as an ingredient of pot-pourri[238]. They were formerly used as a strewing herb[14] The plant repels insects, rats etc[14, 18, 20]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Dynamic accumulator.

dwatta Anodyne Antiseptic Antispasmodic Aromatherapy Carminative Chologogue Diaphoretic Refrigerant Stomachic Tonic VasodilatorWhite peppermint is a very important and commonly used remedy, being employed by allopathic doctors as well as herbalists[9]. It is also widely used as a domestic remedy. This cultivar is considered to be milder acting than black peppermint (*Mentha x piperita vulgaris*). A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders (especially flatulence) and various minor ailments[222, 238]. The herb is abortifacient, anodyne, antiseptic, antispasmodic, carminative, chologogue, diaphoretic, refrigerant, stomachic, tonic and vasodilator[4, 9, 21, 165, 238]. An infusion is used in the treatment of irritable bowel syndrome, digestive problems, spastic colon etc[254]. Externally a lotion is applied to the skin to relieve pain and reduce sensitivity[254]. The leaves and stems can be used fresh or dried, they are harvested for drying in August as the flowers start to open[4]. The essential oil in the leaves is antiseptic and strongly antibacterial,

though it is toxic in large doses[222, 254]. When diluted it can be used as an inhalant and chest rub for respiratory infections[254]. The essential oil is used in aromatherapy. Its keyword is 'Cooling'[210].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for the production of essential oils, but the plant also succeeds in partial shade. Prefers a slightly acid soil[16]. Often grown in the herb garden and also commercially for its essential oil. The whole plant has a pleasant aroma of peppermint. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The flowers are very attractive to bees and butterflies[24]. A good companion for growing near cabbages and tomatoes, helping to keep them free of insect pests[14, 20]. Produces a better quality essential oil if the plant is grown in dry ground[115]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 4.2.126 *Empetrum nigrum*

Crowberry, Black crowberry, Black Crowberry 3 tlin 8 cyuc 3 kcaak 1 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjutnyk hpa7tli frusflatprik hpa7tmwatli nyanhjen hjonli

drutta *Empetrum nigrum* is an evergreen Shrub growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[1, 2, 3, 5, 65]. It can taste slightly acid or insipid[101]. Not very desirable[111], it tastes best after a frost[172]. A watery flavour, it is mainly used for making drinks, pies, preserves etc[183]. The Inuit dry or freeze them for winter use[183]. The fruit can hang on the plant all winter[172]. The fruit is about 7.5mm in diameter[200]. A tea can be made from the twigs[183].

tcanta DyeA purple dye is obtained from the fruit[115]. Can be used for groundcover in exposed locations[200]. Plants should be spaced about 25cm apart each way[208].

dwatta Astringent Diuretic Kidney OphthalmicThe leafy branches have been used, especially for children with a fever, as a diuretic[257]. It has also been used to treat kidney problems[257]. A decoction or infusion of the stems, or the cooked berries, have been used in the treatment of diarrhoea[257]. A decoction of the leaves and stems, mixed with Hudson Bay tea and young spruce tree tips, has been used in the treatment of colds[257]. A decoction of the roots has been used as an eyewash to remove a growth[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be very slow to germinate, stored seed requires 5 months warm then 3 months cold stratification at 5°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 3cm with a heel, July/August in a frame. Takes 3 weeks. Good percentage[78, 200]. Cuttings of mature wood of the current year's growth, 3cm with a heel, October in a frame. Requires shade. Good percentage[78, 200].

nwatta Landscape Uses:Erosion control, Foundation, Ground cover, Massing, Rock garden. A calcifuge plant, it is easily grown in a lime-free soil[200]. Prefers a moist sandy peaty soil and some shade[1, 3]. The two names var. 'Rubrum' and var. 'Purpureum' are of doubtful application to this species and may refer to *E. eamesii*[200]. Plants are usually dioecious though hermaphrodite forms are known. Male and female plants will normally need to be grown if fruit and seed are required. Special Features:Attractive foliage, North American native, Inconspicuous flowers or blooms.

## 4.2.127 Tragopogon pratensis

Goat's Beard

3 tlin 7 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasjlutnyikfriip hpa7tli flatprikliwis  
hpa7tmwatli fyfxxre7t hjonli

drutta Tragopogon pratensis is a ANNUAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves Root StemEdible Uses: Root - raw or cooked[2, 9, 12, 52, 100]. The roots have a sweet flavour due to their inulin content[7]. The young roots can be eaten raw whilst older roots are best cooked like parsnips or salsify[9]. They are often blanched before use[183]. Young leaves and shoots - raw or cooked[2, 5, 12, 52, 62, 183]. They can be added to mixed salads or used in soups etc[7, 9]. The leaves are best used as they come into growth in the spring[9]. The flowering stem, including the buds, is cooked and served like asparagus[183].

tcanta CosmeticAn infusion of the petals is used to clear the skin and lighten freckles[7]. A distilled water made from the plant is used in cleansing lotions for dry skins[7].

dwatta Astringent Depurative Diuretic Expectorant StomachicGoat's beard is considered to be a useful remedy for the liver and gallbladder[254]. It appears to have a detoxifying effect and may stimulate the appetite and digestion. Its high inulin content makes this herb a useful food for diabetics since inulin is a nutrient made of fructose rather than glucose units and therefore does not raise blood sugar levels[254]. The root is astringent, depurative, diuretic, expectorant, nutritive and stomachic[7, 21]. A syrup made from the root gives great relief in cases of obstinate coughs and bronchitis[7]. A decoction of the root is given in the treatment of heartburn, loss of appetite and disorders of the breast or liver[240]. The root is harvested in the autumn and dried for later use[7]. The fresh juice of young plants is said to be a good dissolver of bile, relieving the stomach without side effects[4].

propta Seed - sow spring in situ. Make sure to water the seed in if the weather is dry.

nwatta Succeeds in ordinary garden soils, including heavy clays[200]. Goat's beard was formerly cultivated as a vegetable, though it has now fallen into disuse[2, 4]. Grows well in the summer meadow[24]. The flowers open at day-break and close before noon[4].

## 4.2.128 Campanula latiloba

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli prikliwis  
hpa7tmwatli fyfxxre7t hjonli

drutta Campanula latiloba is an evergreen Perennial growing to 0.9 m (3ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[K]. Pleasantly sweet, though individual leaves are quite small. The leaves are available all year round. Flowers - a pleasant taste and texture with a slight sweetness[K].

tcanta Plants can be grown for ground cover when planted about 45cm apart each way, they form spreading clumps[208].

dwatta None known  
propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. Easy[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta An easily grown plant that succeeds in almost any soil[221], it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in full sun though it also tolerates partial shade[1, 200, 208]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Plants are hardy to at least -15°C[200]. If the plants are cut back by half after the first flush of flowering, they will usually produce a second flush[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Plants often self-sow in British gardens[221]. There are some named forms selected for their ornamental value[208]. This species is very closely related to *C. persicifolia*, differing from that species in having stalkless flowers and stiff rather thick angular stems[271]. The main difference from a gardener's viewpoint is that this species is coarser and more robust with stems that rarely blow over[271]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.129 Fritillaria pudica

Yellow Fritillary

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Fritillaria pudica is a BULB growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils.

therapeutic guide to herbal medicine, approve Equisetum arvense for urinary tract infections, kidney and bladder stones, wounds and burns (see [302] for critics of commission E).

propta Spores - best collected as soon as they are ripe in the spring and surface-sown immediately on a sterile compost. Keep moist and pot up as soon as the plants are large enough to handle. Very difficult[200]. Division. The plants usually spread very freely when well sited and should not really need any assistance.

nwatta Prefers poor dusty ground[53, 54]. This rather contradicts another report which says that the presence of this plant indicates underground water[4]. Prefers a moist but well-drained fertile soil with a pH between 6.5 and 7.5[200, 238]. A very cold-hardy species tolerating temperatures down to about -30°C[200]. Plants have a deep and penetrating root system and can be invasive. If grown in the garden they are best kept in bounds by planting them in a large container which can be sunk into the ground[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 4.2.208 Quercus mongolica grosseserrata

3 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat m hkuc  
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis  
hpa7tmwatli hjonli

drutta Quercus mongolica grosseserrata is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - hard, easily worked. Used for furniture, panelling, furniture etc[46].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants toler-

ate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 4.2.209 Adenophora liliifolia

Ladybells, Lilyleaf

3 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Adenophora liliifolia is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a medium rate. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. Thick and esculent[2, 61, 105], it has a sweet flavour[74]. Eaten boiled and in soups etc[46, 177].

tcanta None known  
dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Landscape Uses:Border, Container, Woodland garden. Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Plants are intolerant of root disturbance and should be planted out into their permanent positions when young[1]. This species has been cultivated for its edible root in Japan[46, 238]. The flowers have a sweet but refreshing perfume[245]. This is the only member of the genus with scented flowers[245]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K]. Special Features: Not North American native, Naturalizing, Suitable for cut flowers, Fragrant flowers.

## 4.2.210 Mentha x piperita citrata

Eau De Cologne Mint, Eau de Cologne Mint, Peppermint  
3 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfriip hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Mentha x piperita citrata is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. Used as a flavouring in salads or cooked foods[5]. A very pungent flavour, the leaves of the true eau-de-cologne mint are too aromatic for most tastes, though the cultivar 'Basil' has an excellent flavour and makes a very good substitute for basil in pesto[K]. A herb tea is made from the fresh or dried leaves[21, 183].

tcanta Essential Repellent StrewingLandscape Uses: Container, Ground cover, Woodland garden. An essential oil obtained from the whole plant is a source of lavender oil which is used in perfumery[46, 105, 238]. It is also used in oral hygiene preparations, toiletries etc[238]. Formerly used as a strewing herb[14], the plant repels insects, rats etc[14,

then only in a very well sheltered position. Division. This is best done in the spring but it succeeds at most times of the year[1].

nwatta Landscape Uses:Border, Container, Erosion control, Foundation, Ground cover, Massing, Rock garden, Woodland garden. Easily grown in most light soils[187]. Prefers a soil of leaf mould and a cool but not too moist clay[1]. Prefers a cool damp shady position[1]. Thrives in dry shade[28, 188]. Established plants are drought tolerant[208]. They grow well on drystone walls[200]. Plants of ten grow as epiphytes[28, 31]. Members of this genus are rarely if ever troubled by browsing deer[233]. A rather variable plant, it is considered to be an aggregate species of several very similar species[187]. Only the roots should be planted, the rhizome being fixed to the surface of the soil[1, 187]. Special Features: Attractive foliage, Not North American native, There are no flowers or blooms. Polypodium virginianum (Polypodium vulgare subsp. virginianum (L.) Hultén is a synonym of Polypodium virginianum L.) commonly know as rock cap fern, or common polypody tolerates hardness zones down to 3. It prefers acidic soil. It is a small evergreen species of fern native to the Eastern United States and Canada. It generally grows on rocks and occasionally on tree roots in nature. A small rhizomatous fern with narrow leaves 8–40 centimetres (3.1–15.7 in) long and 3–6 centimetres (1.2–2.4 in) wide. Polypodium virginianum typically grows on boulders, cliffs, and rocky slopes and does not need well-developed soil. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.206 Geum canadense

White Avens, Texan avens  
3 tin 7 cyuc 2 kcaok 0 tcan 0 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Geum canadense is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: ChocolateThe boiled roots are a chocolate substitute[183]. The roots are also gathered in spring before the plant comes into growth and are used as a flavouring and preservative in ale[207].

tcanta None known  
dwatta None known  
propta Seed - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer/ Division in spring or autumn. This should be done every 3 - 4 years in order to maintain the vigour of the plant[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any moderately good garden soil that is well-drained[1]. Prefers a soil rich in organic matter[200]. Plants are hardy to at least -15°C[200]. Hybridizes freely with other members of this genus[200].

## 4.2.207 Equisetum arvense

Field Horsetail  
3 tin 11 cyuc 2 kcaok 4 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli kyuctup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Equisetum arvense is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. The seeds ripen in April. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Root StemEdible Uses: Strobil (the fertile shoots in spring) - cooked and used as an asparagus substitute[7, 46, 61, 94]. They should be used when young[116] but even so it is probably best to change the water, perhaps 3 - 4 times[85, 102]. One report says that they can be eaten raw[172], they are peeled and the shoot tip is discarded[213]. It is said to be a very tedious operation and they should not be eaten raw in any quantity, see the notes above on toxicity[K]. Some native tribes liked to eat the young vegetative shoots, picked before they had branched out, and would often collect them in great quantity then hold a feast to eat them[257]. The leaf sheaths were peeled off and the stems eaten raw - they were said to be 'nothing but juice' [257]. Roots - raw[61]. The tuberous growths on the rhizomes are used in the spring[172]. The black nodules attached to the roots are edible[257]. It takes considerable effort to collect these nodules so it is normally only done in times of desperation. However, native peoples would sometimes raid the underground caches of roots collected by lemmings and other rodents in order to obtain these nodules[257]. A further report says that the peeled stems, base of the plant, root and tubers were eaten raw by the N. American Indians, the report went on to say that this may be inadvisable[85].

tcanta Dye Fungicide Liquid feed Musical Paper Polish Sandpaper ScourerThe stems contain 10% silica and are used for scouring metal[4, 7, 20, 94, 102] and as a fine sandpaper[7, 54, 99, 257]. They can also be used as a polish for brass, hardwood etc[94]. The infused stem is an effective fungicide against mildew, mint rust and blackspot on roses[14, 18, 20, 54]. It also makes a good liquid feed[54]. A light pink dye is obtained from the stem[99, 257]. It is yellow-gray according to another report[102]. The plant has been used for making whistles[257].

dwatta Anodyne Antirheumatic Antiseptic Astringent Cardiac Carminative Diaphoretic Diuretic Eczema Galactogogue Haemostatic Homeopathy Nervine TB Urinary VulneraryHorsetails have an unusual chemistry compared to most other plants[238]. They are rich in silica, contain several alkaloids (including nicotine) and various minerals[238]. Horsetail is very astringent and makes an excellent clotting agent, staunching wounds, stopping nosebleeds and reducing the coughing up of blood[254]. It helps speed the repair of damaged connective tissue, improving its strength and elasticity[254]. The plant is anodyne, antihæmorrhagic, antiseptic, astringent, carminative, diaphoretic, diuretic, galactogogue, haemostatic and vulnerary[4, 7, 9, 20, 21, 46, 61, 165, 172, 218, 240]. The green infertile stems are used, they are most active when fresh but can also be harvested in late summer and dried for later use[4, 9]. Sometimes the ashes of the plant are used[4]. The plant is a useful diuretic when taken internally and is used in the treatment of kidney and bladder problems, cystitis, urethritis, prostate disease and internal bleeding, proving especially useful when there is bleeding in the urinary tract[4, 238, 254]. A decoction applied externally will stop the bleeding of wounds and promote healing[4]. It is especially effective on nose bleeds[7]. A decoction of the herb added to a bath benefits slow-healing sprains and fractures, as well as certain irritable skin conditions such as eczema[254]. The plant contains equisetin acid, which is thought to be identical to acetic acid. This substance is a potent heart and nerve sedative that is a dangerous poison when taken in high doses[213]. This plant contains irritant substances and should only be used for short periods of time[238]. It is also best only used under the supervision of a qualified practitioner. A homeopathic remedy is made from the fresh plant[7]. It is used in the treatment of cystitis and other complaints of the urinary system[7]. The German Commission E Monographs, a

It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Root SeedpodEdible Uses: Bulb - raw or cooked[46, 61, 161]. It can also be dried for later use[46]. Commonly eaten as a food by the native North Americans, the small bulbs were eaten raw and the larger ones cooked[270]. Rich in starch, it is best used in the autumn[172]. The raw bulb tastes like potatoes, when cooked it tastes like rice[212]. It can be eaten as a vegetable or can be added to soups etc[257]. The green seedpods can be eaten raw or cooked but are bitter[172]. A delicious flavour[212].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta Best grown on a gritty well-drained sunny bank[42]. Plants must be kept dry in the summer[90, 134]. A very variable[270] and ornamental plant[1], but it is not easy to grow outdoors, though it has lived a long time in a bulb frame[90]. Flowers are produced in 4 - 6 years from seed[164]. The bulb produces bulbils freely[90].

## 4.2.130 Fragaria virginiana

Scarlet Strawberry, Virginia strawberry  
3 tin 7 cyuc 3 kcaok 2 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Fragaria virginiana is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw, cooked or made into preserves[2, 27, 101, 183]. Sweet and succulent. Small but delicious[159]. The fruit is up to 20mm in diameter[200]. The dried leaves are a very pleasant tea substitute[55, 62, 183]. Rich in vitamin C[159].

tcanta TeethThe fruits are used as a tooth cleaner[55, 62]. They are held in the mouth, or rubbed over the teeth, to remove tartar[257]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiseptic Astringent Emmenagogue Galactogogue Odontalgic Poultrice Vitamin CThe whole plant is antiseptic, astringent, emmenagogue, galactogogue and odontalgic[172]. It has been used to regulate the menstrual cycle[172]. A tea made from the leaves has been used as a nerve tonic and is slightly astringent[222]. A poultice made from the dried powdered leaves mixed with oil has been used to treat open sores[257]. A tea made from the roots is diuretic[222]. It has been used in the treatment of diarrhoea, irregular menses, gonorrhoea, stomach and lung ailments[222, 257].

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit

in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[27, 200]. Tolerates semi-shade though fruit production will be reduced when plants grow in such a position. The plants appreciate a mulch of pine or spruce leaves[18]. Along with *F. chiloensis*, this species is probably a parent of the cultivated strawberries. The cultivar 'Little Scarlet' is a form of this species and this is still occasionally cultivated for its fruit in Britain[119]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 4.2.131 Asarum canadense

Snake Root, Canadian wildginger, Canada Wild Ginger, Wild Ginger

3 tin 9 cyuc 3 kcaok 3 tcan 3 dwat 0.1 m hkuc  
pcimhmm cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Asarum canadense is a deciduous Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe underground stem and the flowers are used as a ginger substitute[2, 55, 106, 177, 183]. The root, especially when quite dry, has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic[245]. The root is best harvested in autumn but is available all year round[159]. It can be dried for later use[159].

tcanta IncenseThe slightly roasted root can be ground into a powder and then sprinkled onto clothing for perfume[257]. A useful ground cover for a shady position so long as it is not dry[197], spreading by its roots[208].

dwatta Anthelmintic Antiasthmatic Antibiotic Antitumor Carminative Contraceptive Diaphoretic Diuretic Expectorant Irritant Poultrice Salve Stimulant Stomachic TonicSnake root was widely employed as a medicinal herb by a number of native North American tribes who used it to treat a wide range of ailments[257]. It is still occasionally used in modern herbalism. The root is anthelmintic, carminative, diaphoretic, diuretic, expectorant, irritant, powerfully stimulant, stomachic and tonic[4, 21, 46, 200, 238, 257]. It is harvested in the autumn and dried for later use[4]. It is used in the treatment of chronic chest complaints, asthma, coughs, colds, dropsy, painful spasms of the bowels and stomach, scant or painful menstruation, infantile convulsions[4, 257]. The fresh leaves are applied as a poultice to wounds and inflammations, whilst a decoction or salve is applied to sores[257]. The root contains antibiotic substances effective against broad-spectrum bacteria and fungi[207]. It also contains aristolochic acid, which has antitumor activity[222]. The root and rhizome were slowly boiled in a small quantity of water for a long time and the resulting liquid drunk as a contraceptive by the women of one N. American Indian tribe[213].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Landscape Uses:Ground cover, Massing, Rock garden, Woodland garden. Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are found on alkaline soils in the wild[43]. Plants are hardy to at least -25°C[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200]. Special Features:Attractive foliage, North American native, Naturalizing, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.132 Viola cucullata

Marsh Blue Violet

3 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwss hpa7tmwatli fyfixre7t hjonli

drutta Viola cucullata is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Cleistogamy (self-pollinating without flowers ever opening). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaY-oung leaves and flower buds - raw or cooked[61, 105]. When added to soup they thicken it in much the same way as okra[85, 159, 177]. A tea can be made from the leaves[85].

tcanta RepellentA good ground cover plant but it is slow to thicken up and may need weeding for the first year or so[197]. An infusion of the root has been used to soak corn seeds before planting them in order to keep off insects[257]. Faunal Associations: The floral nectar of Marsh Violet attracts bumblebees, mason bees (*Osmia* spp.), Halictid bees, Andrenid bees, bee flies (Bombyliidae), butterflies, and skippers (Robertson, 1929). Some of the bees also collect pollen. An oligolectic bee, *Andrena violae*, visits the flowers of Marsh Violet and other *Viola* spp. (violets). The caterpillars of several Fritillary butterflies feed on the foliage of violets primarily in open areas: *Boloria bellona* (Meadow Fritillary), *Boloria selene myrina* (Silver-Bordered Fritillary), *Euptoieta claudia* (Variegated Fritillary), *Speyeria aphrodite* (Aphrodite Fritillary), *Speyeria atlantis* (Atlantis Fritillary), *Speyeria cybele* (Great Spangled Fritillary), and *Speyeria idalia* (Regal Fritillary). Other insect feeders include caterpillars of the moths *Elaphria grata* (Grateful Midget) and *Eubaphe mendica* (The Beggar), the leaf-mining larvae of *Ametastegia pallipes* (Violet Sawfly), the aphid *Neotoxoptera violae*, and the thrips *Odontothrips pictipennis*. The seeds and other parts of violets are occasionally eaten by such birds as the Ruffed Grouse, Wild Turkey, and Mourning Dove, and they are also consumed by the White-Footed Mouse, Pine Mouse, and Eastern Chipmunk. Similarly, the foliage of these low-growing plants is a source of food for the Cottontail Rabbit and Wood Turtle (*Clemmys insculpta*) [1-6].

dwatta Analgesic Dysentery PoulticeAn infusion of the plant has been used in the treatment of coughs, colds and dysentery[257]. A poultice of the leaves has been used to reduce the pain of headaches[257]. A poultice of the crushed root has been applied to boils[257].

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Very intolerant of drought[187]. Succeeds in dense shade[197]. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5. This plant produces cleistogamous flowers as well as the usual insect pollinated flowers[187]. It usually self-sows freely[188]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. A polymorphic species[188]. there are many named forms, selected for their ornamental value[200].

## 4.2.133 Rhexia virginica

Deer Grass, Handsome Harry

3 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Rhexia virginica is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: DrinkLeaves - raw or cooked[105]. A sweetish slightly acid taste[106, 183, K]. It makes a pleasant salad[183]. Roots - raw. They can be chopped and added to salads or used as a pleasant nut-like nibble[183]. A sour drink is made from the leaves and stems[257].

tcanta MiscellanyNone known dwatta MiscellanyA tea made from the leaves and stems is used as a throat cleaner[257].

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination should take place within 10 weeks. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold greenhouse or frame for their first winter. Plant out in late spring[K]. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Requires a moist but freely draining neutral or acid peaty soil[200]. Incorporate sand or grit into the soil if necessary at planting time[200]. Grows well in a bog garden[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 4.2.134 Asclepias tuberosa

Pleurisy Root, Butterfly milkweed, Rolfs' milkweed, Indian Paintbrush

3 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.8 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwss hpa7tmwatli xre7t hjonli

drutta Asclepias tuberosa is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). Suitable for:

Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:Not North American native, Inconspicuous flowers or blooms.

## 4.2.203 Primula elatior

Oxlip

3 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc pcmimhim cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwss hpa7tmwatli fyfixre7t hjonli

drutta Primula elatior is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked in soups etc[13]. They have a mild flavour and are available in late winter[K].

tcanta MiscellanyNone known dwatta Diuretic Expectorant MiscellanyThe root is diuretic and expectorant[9, 13]. It is used in the treatment of coughs, flu and other febrile conditions, insomnia and migraine[9, 13]. The root can be harvested in the spring or autumn and is dried for later use[9].

propta Seed - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. Germination is inhibited by temperatures above 20°C[200]. Prick out the seedlings into individual pots when large enough to handle and plant out in the summer. Division in autumn. This is best done every other year[200].

nwatta Prefers a medium to heavy moisture retentive humus rich loam in a cool position with light to medium shade[200], though it succeeds in heavier shade[187]. Grows well in heavy clay soils and in chalky soils[187]. A very ornamental plant[1], there are a number of subspecies[187]. The subspecies *P. elatior meyeri* is a parent of the *P. x pruhonicensis* group of ornamental hybrids[187]. This species hybridizes readily with *P. vulgaris*[17].

## 4.2.204 Aquilegia formosa truncata

Columbine

3 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwss hpa7tmwatli xre7t hjonli

drutta Aquilegia formosa truncata is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172, 213], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K]. Children enjoy sucking out the sweet nectar from the base of the flowers[257]. Early spring greens cooked and eaten as a vegetable[257]. Some caution is advised, see the notes above on toxicity. Root - cooked. Used by the N. American Indians as a famine food[213]. Some caution is advised, see the notes above on toxicity.

tcanta Parasiticide ParasiticideThe seed is used to rid the hair of lice[172, 257]. The whole plant is boiled up and used as a hair wash[213, 257]. The seeds are aromatic. They can be crushed and rubbed on the body as a perfume or placed in a sachet and stored with clothes to impart a nice smell[257].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveWestern columbine was quite frequently employed by a number of native North American Indian

tribes who used it to treat a variety of complaints[257]. It is little used in modern herbalism. Antispasmodic, diaphoretic, parasiticide, resolvent, salve[172]. A decoction of the root is used in the treatment of diarrhoea and stomach aches[257]. A decoction of the roots and leaves is used in the treatment of VD, dizziness and biliousness[257]. The mashed fresh roots can be rubbed briskly on aching rheumatic joints[257]. A poultice of chewed roots or leaves is applied to bee stings, sores etc[257]. A decoction of the leaves is used in the treatment of sore throats, coughs and colds[257]. The seeds can be chewed as a remedy for stomach aches[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. A very ornamental plant[1], it is hardy to about -15°C[187]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 4.2.205 Polypodium vulgare

Polypody, Adders Fern, Golden Maidenhair Fern, Wall Fern, Common Polypod Fern

3 tlin 6 cyuc 2 kcaak 3 tcan 3 dwat 0.3 m hkuc pcmimhim cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwss hpa7tmwatli hjonli

drutta Polypodium vulgare is an evergreen Fern growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root. Very sweet, it contains sugars, tannin and oils[13]. It is used as a liquorice adulterant[7]. The root has a unique, rather unpleasant odour and a sweet (cloying) flavour at first though it quickly becomes nauseating[222]. The root contains 15.5% saccharose and 4.2% glucose[218].

tcanta Insecticide PotashPlants can be grown as a ground cover in a shady position[188, 200]. They form a spreading carpet and are best spaced about 30cm apart each way[208]. The ash of burnt leaves is rich in carbonate of potash[4].

dwatta Alterative Anthelmintic Cholagogue Demulcent Diuretic Expectorant Pectoral Purgative TonicPolydopy stimulates bile secretion and is a gentle laxative. In European herbal medicine it is traditionally used as a treatment for hepatitis and jaundice and as a remedy for indigestion and loss of appetite[254]. It should not be used externally since it can cause skin rashes[254]. The root is alterative, anthelmintic, cholagogue, demulcent, diuretic, expectorant, pectoral, purgative, tonic[4, 238, 240]. It can be used either fresh or dried and is best harvested in October or November, though it can be collected until February[4]. The leaves can also be used but are less active[4]. A tea made from the roots is used in the treatment of pleurisy, hives, sore throats and stomach aches and as a mild laxative for children[222]. It was also considered of value for lung ailments and liver diseases[222]. The poulticed root is applied to inflammations[222]. A tea or syrup of the whole plant is anthelmintic[222].

propta Spores - best sown as soon as they are ripe, though they can also be sown in the spring. Sow them on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and

The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.201 Hypericum perforatum

St. John's Wort, Common St. Johnswort  
3 tlin 7 cyuc 2 kcaak 2 tcan 4 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Hypericum perforatum is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe herb and the fruit are sometimes used as a tea substitute[7, 183]. The flowers can be used in making mead[183].

tcanta Dye TanninYellow, gold and brown dyes are obtained from the flowers and leaves[168]. A red is obtained from the flowers after acidification[141]. A red dye is obtained from the whole plant when infused in oil or alcohol[7, 61, 115]. A yellow is obtained when it is infused in water[7, 74, 115]. The plant is said to contain good quantities of tannin, though exact figures are not available[223].

dwatta Analgesic Antidepressant Antiseptic Antispasmodic Aromatic Astringent Cholagogue Digestive Diuretic Expectorant Homeopathy Nerve Resolvent Sedative Stimulant Vermifuge VulnerarySt. John's wort has a long history of herbal use. It fell out of favour in the nineteenth century but recent research has brought it back to prominence as an extremely valuable remedy for nervous problems[254]. In clinical trials about 67% of patients with mild to moderate depression improved when taking this plant[254]. The flowers and leaves are analgesic, antiseptic, antispasmodic, aromatic, astringent, cholagogue, digestive, diuretic, expectorant, nerve, resolvent, sedative, stimulant, vermifuge and vulnerary[4, 9, 13, 21, 165, 218, 222]. The herb is used in treating a wider range of disorders, including pulmonary complaints, bladder problems, diarrhoea and nervous depression[4]. It is also very effectual in treating overnight incontinence of urine in children[4]. Externally, it is used in poultices to dispel herd tumours, caked breasts, bruising etc[4]. The flowering shoots are harvested in early summer and dried for later use[7]. Use the plant with caution and do not prescribe it for patients with chronic depression[238]. The plant was used to procure an abortion by some native North Americans, so it is best not used by pregnant women[257]. See also the notes above on toxicity[21, 222]. A tea or tincture of the fresh flowers is a popular treatment for external ulcers, burns, wounds (especially those with severed nerve tissue), sores, bruises, cramps etc[222, 238]. An infusion of the flowers in olive oil is applied externally to wounds, sores, ulcers, swellings, rheumatism etc[240]. It is also valued in the treatment of sunburn and as a cosmetic preparation to the skin[240]. The plant contains many biologically active compounds including rutin, pectin, choline, sitosterol, hypericin and pseudohypericin[222]. These last two compounds have been shown to have potent anti-retroviral activity without serious side effects and they are being researched in the treatment of AIDS[222, 238]. A homeopathic remedy is made from the fresh whole flowering plant[232]. It is used in the treatment of injuries, bites, stings etc and is said to be the first remedy to consider when nerve-rich areas such as the spine, eyes, fingers etc are injured[232].

propta Seed - sow in a greenhouse as soon as it is ripe in the autumn or in the spring. It normally germinates in 1 - 3 months at 10°C. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111, 238]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any reasonably good well-drained but moisture retentive soil[1]. Succeeds in dry soils[238]. Plants grow well in sun or semi-shade but they flower better when in a sunny position[200]. St. John's wort is often found as a weed in the garden[1]. It grows well in the summer meadow and is a useful plant for attracting insects[24]. The whole plant, especially when in bloom, gives off a most unpleasant smell when handled[245]. Hypericum perforatum is apparently an allotetraploid that would appear to have arisen from a cross between two diploid taxa, viz. *H. maculatum* subsp. *maculatum* (Europe to western Siberia) and *H. attenuatum* (western Siberia to China)[266]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 4.2.202 Acer mono

Maple

3 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Acer mono is a deciduous Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SapEdible Uses: The sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[105, 177]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (*A. saccharum*). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. Leaves - cooked. A famine food, they are only used when all else fails[179].

tcanta Fuel Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - hard, close grained[46]. Used as a fuel[46].

dwatta Astringent IrritantThe leaves are an irritant[240]. The bark is astringent[240].

propta Seed of this species is rarely available. If obtained, it is best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Grafting onto the roots of *A. platanoides* is usually successful, but the graft should be made as low as possible to reduce the incident of suckers from the rootstock.

nwatta Landscape Uses:Specimen. Of easy cultivation, it prefers a good moist well-drained soil[111] and a position that is at least moderately sunny[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. A polymorphic species[58], it is closely related to *A. truncatum*[11].

light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil Root SeedpOD  
Uses: Oil SweetenerWhilst most parts of this plant have been used as food, some caution is advised since large doses can cause diarrhoea and vomiting - see the notes above on toxicity. Flower buds - cooked. They taste somewhat like peas[85]. Young shoots - cooked. An asparagus substitute[2, 4, 46, 85, 183]. The tips of older shoots are cooked like spinach[85]. Young seed pods - cooked. Harvested when 3 - 4 cm long and before the seed floss begins to form, they are very appetizing[2, 4, 21, 61, 85]. The flower clusters can be boiled down to make a sugary syrup[2, 4, 85, 183]. In hot weather the flowers produce so much nectar that it crystallises out into small lumps which can be eaten like sweets, they are delicious[K]. Root - cooked[2, 4, 46, 61, 85, 105]. A nutty flavour[163]. Some reports say that it is poisonous[183]. An edible oil is obtained from the seed[112]. The seed is very small, however, and commercial usage would not be very viable.

tcanta Fibre Latex Oil Pollution StuffingA good quality fibre is obtained from the bark and is used in making twine, cloth etc[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[169]. It is a kapok substitute, used in life jackets or as a stuffing material[169]. Very water repellent. The floss has also been used to mop up oil spills at sea. The plant is a potential source of latex, used for making rubber[57]. This species is the only member of the genus that does not have latex in its sap[213]. The seed-pods contain an oil and a wax which are of potential importance. Candle wicks are made from the seed floss. The seed contains up to 21% of a semi-drying oil[112]. The dogbane-milkweed family Asclepias, Apocynum, Calotropis, and Trachomitum spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed finer or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

dwatta Antispasmodic Carminative Cathartic Diaphoretic Diuretic Dysentery Expectorant Poulitce Tonic VasodilatorPleurisy root is a bitter, nutty-flavoured tonic herb that increases perspiration, relieves spasms and acts as an expectorant[238]. It was much used by the North American Indians and acquired a reputation as a heal-all amongst the earlier white settlers[254, 257]. Its main use in present day herbalism is for relieving the pain and inflammation of pleurisy[254]. The root is antispasmodic, carminative, mildly cathartic, diaphoretic, diuretic, expectorant, tonic and vasodilator[4, 21, 46, 165]. The root was very popular as a medicinal herb for the treatment of a range of lung diseases, it was considered especially useful as an expectorant[4, 213, 254]. It has never been scientifically examined and warrants further investigation[213]. It has also been used internally with great advantage in the treatment of diarrhoea, dysentery, rheumatism etc[4]. Use with caution[21]. This remedy should not be prescribed for pregnant women[238]. See also the notes above on toxicity. The root is harvested in the autumn and can be used fresh or dried[238]. A poultice of the dried, powdered roots is used in the treatment of swellings, bruises, wounds, ulcers, lameness etc[222, 238, 268].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use

shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Experimental Crop Industrial Crop: Hydrocarbon Management: HayLandscape Uses:Border, Container, Foundation, Massing, Rock garden, Seashore, Specimen. Prefers a well-drained light, rich or peaty soil[1, 200]. Prefers a sandy soil and a sunny position[111, 233]. Prefers a slightly acid soil[238]. Prefers a dry soil[187, 238]. Plants are hardy to about -20°C[187]. Another report says that this species is only suited to the warmer areas of Britain[233]. A very ornamental plant[1], but it is not easy to establish or to keep in British gardens[233]. Resents root disturbance[4, 134], plants should be pot-grown from seed and planted out in their permanent positions when young. Plants are particularly at risk from slugs, however, and some protection will probably be required until the plants are established and also in the spring when the new shoots come into growth[K]. The flower can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. Special Features: Attractive foliage, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

## 4.2.135 Ribes fragnans

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ribes fragnans is a deciduous Shrub growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. A gooseberry with a sweet and pleasant flavour[2, 105]. The fruit is about 8mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[111, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°C[200]. The whole plant is aromatic with a smell reminiscent of balm[200]. This species is closely related to *R. humisonianum*[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.136 Erythronium dens

Dog's-Tooth Violet

3 tlin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium dens-canis is a BULB growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardness.

It is hardy to UK zone 3 and is not frost tender. It is in flower from April to June, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Leaves **RootEdible Uses:** Bulb - raw or cooked and used as a vegetable[46]. It can be dried to make a flour[22, 46, 61] and is also the source of a starch used in making 'vermicelli' and cakes[183]. Leaves - cooked[46, 61, 183]. Eating the leaves will greatly reduce the vigour of the bulb, so can only be recommended in times of emergency[K].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Thrives in light grass[90, 200]. This species does not flower very freely, increasing mainly by its stoloniferous habit[164]. Flowers are produced in 3 - 4 years from seed[164]. Bulbs should be planted about 7cm deep[1]. There are many named forms, selected for their ornamental value[207]. Many of these cultivars have a habit to divide freely to form clumps containing many small non-flowering bulbs[257]. To remedy this, the bulbs should be lifted and divided, replanting them singly about 10cm below soil level[258].

## 4.2.137 Streptopus streptopoides

Small twistedstalk

3 tin 7 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Streptopus streptopoides is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Fruit **LeavesEdible Uses:** Young leaves and shoots - raw or cooked. A cucumber flavour[172]. Fruit - raw or cooked. A watermelon flavour[172]. The orange-red berries are about 6mm in diameter[270].

tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in a cold frame as soon as it is received. The seed, especially if it has been stored, can be very slow to germinate, sometimes taking 18 months or more. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in a shady part of the greenhouse or cold frame. It will normally take 2 or more growing seasons before the roots are large enough to plant out - this is best done when the plant is dormant in the autumn. Division as the plant comes into growth in early spring. Larger divisions can be planted out direct

into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame for their first year, planting them out in the following spring.

nwatta Requires a cool leafy soil in shade or partial shade[200]. Thrives in a moist light soil containing organic matter[1]. Hardy to at least -20°C.

## 4.2.138 Oxalis acetosella

Wood Sorrel

3 tin 7 cyuc 3 kcaak 3 tcan 2 dwat 0.1 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Oxalis acetosella is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, cleistogamy. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers **LeavesEdible Uses:** Curdling agentLeaves - raw or cooked[2, 7, 12, 37]. A delicious lemony flavour, the leaves make a refreshing, thirst-quenching munch and are also added to salads, soups, sauces etc[183]. This leaf should be used in moderation[4, 5, 9, 76], see the notes above on toxicity. Flowers - raw. A decorative addition to salads[K]. The dried plant can be used as a curdling agent for plant milks[66].

tcanta CleanserThe juice of the leaves removes iron mould stains from linen[6, 66, 115]. Plants can be grown as a ground cover in woodland or under the shade of shrubs[208]. They should be spaced about 45cm apart each way[208].

dwatta Anodyne Antiscorbatic Astringent Diuretic Emmenagogue Expectorant Febrifuge Irritant StomachicThe fresh or dried leaves are anodyne, antiscorbatic, astringent, diuretic, emmenagogue, expectorant, febrifuge, irritant and stomachic[4, 7, 9, 21]. A decoction is used in the treatment of fevers, both to quench the thirst and allay the fever[4]. Externally, the leaves are crushed and applied locally to dispel boils and abscesses, they also have an astringent affect on wounds[7]. When used internally, some caution is advised due to the oxalic acid content of the leaves[4], the plant is contra-indicated for people suffering from gastritis or a calculus condition[7].

propta Seed - best sown as soon as it is ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers moist shady conditions and a humus rich soil in shade or dappled sunlight[4, 9, 13, 27, 37, 200]. Dislikes very heavy and wet soils[17]. Plants are hardy to about -25°C[187]. A dainty woodland carpeter growing well in a woodland or wild garden[28, 200]. When well sited the plants can run aggressively and also self-sow[208]. The plant flowers in early spring, but does not produce much fertile seed at this time. Most of the fertile seed is produced from cleistogamous flowers during the summer[17].

## 4.2.139 Larix decidua

Larch, European Larch, Common Larch

3 tin 6 cyuc 2 kcaak 0 tcan 3 dwat 45 m hkuc  
htut cyutli tcup hwicli hyishrasjlut hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta Larix decidua is a deciduous Tree growing to 45 m (147ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light

or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. Succeeds in dry soils in the shade[200]. Grows well in light woodland shade[88], succeeding amongst the roots of other plants[233]. Plants are hardy to about -25°C[187]. The plant has an invasive root system and can spread freely when well sited[233]. Slugs are fond of this plant and have destroyed even quite large clumps by eating out all the new growth in spring[K]. Most species in this genus seem to be immune to the predations of rabbits[233]. A very variable plant with many different forms[187], it hybridizes freely with other members of this genus[200].

## 4.2.199 Ajuga reptans

Bugle, Common Bugelweed, Bugleweed, Carpet Bugleweed, Carpetweed, Carpet Bugle

3 tin 10 cyuc 2 kcaak 2 tcan 3 dwat 0.3 m hkuc  
pcimhmimhtut cyutli hगतkyuctcuphja7r hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Ajuga reptans is an evergreen Perennial growing to 0.3 m (1ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from May to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought.

**kcakta Edible Parts:** Leaves**Edible Uses:** Young shoots - raw[7].

tcanta A good ground-cover for a position in semi-shade[200], forming a carpet and rooting as it spreads[208]. Fairly fast growing but it does not always smother out weeds and can become bare at the centre if not growing in good conditions[197]. Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wildfires, these are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level groundcovers provide little fuel.

dwatta Aromatic Astringent Bitter HomeopathyBugle has a long history of use as a wound herb and, although little used today, it is still considered very useful in arresting haemorrhages and is also used in the treatment of coughs and spitting of blood in incipient consumption[4, 254, 268]. The plant contains digitalis-like substances (these are commonly found in Digitalis species and are used in treating heart complaints) and is thought to possess heart tonic properties[268]. It has also been considered good for the treatment of excessive alcohol intake[4]. The whole plant is aromatic, astringent and bitter[4, 7, 9]. The plant is usually applied externally[7]. It is harvested as it comes into flower in late spring and dried for later use[4, 7]. It is also commonly used fresh in ointments and medicated oils[238]. A homeopathic remedy is made from the whole plant. It is widely used in various preparations against throat irritations and especially in the treatment of mouth ulcers[7].

propta Seed - sow spring or autumn in a cold frame. The seed usually germinates in 3 - 4 weeks at 10°C[133], though it can be erratic[238]. Prick out the seedlings when they are large enough to handle and plant them out in the summer[K]. Division of runners at almost any time of year. Very easy, the divisions can be planted straight out into their permanent positions if required.

nwatta Landscape Uses:Border, Container, Erosion control, Ground cover, Massing, Rock garden, Specimen, Woodland garden. Prefers a humus-rich, moisture retentive soil

and partial shade[28, 31, 200]. Does well in marshy soil and in the spring meadow[24]. Grows well in dry shade[187, 190] and is fairly drought-tolerant once established, though it shows distress in severe drought[190]. Plants do not always ripen their seeds in Britain, they spread freely by runners, however, and soon form an extensive patch in suitable conditions[4]. A number of forms have been selected for their ornamental value, several of them are variegated and these are used especially as ground cover plants for dry shade[187]. A purple-leafed form, 'Atropurpurea' does well in full sun so long as the soil is not dry[208]. A good bee and butterfly plant[24]. **Special Features:**Attractive foliage, Not North American native, Naturalizing. Heat Zone: 9-1.

## 4.2.200 Achillea ptarmica

Sneeze-wort, Sneezeweed

3 tin 9 cyuc 2 kcaak 2 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Achillea ptarmica is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Leaves**Edible Uses:** Leaves - raw or cooked[17, 105, 177]. Used as a flavouring in salads[172].

tcanta Essential Hair Miscellany RepellentThe dried, powdered leaves are used as a sneezing powder[61, 100]. Yields an essential oil that is used medicinally[100]. The report does not say what part of the plant the oil is obtained from, it is most likely to be the leaves harvested just before flowering[K]. The leaves are used as an insect repellent[172].

dwatta Antidiarrhoeal Antiemetic Antiflatulent Antirheumatic Appetizer Cardiac Diaphoretic Digestive Emmenagogue Miscellany Odontalgic Sterutatory StypticCardiac, diaphoretic, digestive, emmenagogue, odontalgic, sterutatory, styptic[46, 172]. The leaf is chewed to relieve toothache[207].

propta Seed - sow spring or early autumn in a cold frame[133]. The seed usually germinates in 1 - 3 months[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Very easy, the divisions can be planted direct into their permanent positions. Basal cuttings of new shoots in spring. Very easy, collect the shoots when they are about 10cm tall, potting them up individually in pots and keeping them in a warm but lightly shaded position. They should root within 3 weeks and will be ready to plant out in the summer.

nwatta Landscape Uses:Border, Container, Rock garden, Seashore, Specimen. Succeeds in most soils but prefers a moist well-drained soil in a sunny position[1, 187]. Plants also succeed in partial shade[187]. Plants succeed in maritime gardens[233]. They live longer when growing in a poor soil[200]. The plant has a spreading root system and can be very invasive[233]. Hardy to at least -25°C[187]. There are some named varieties, selected for their ornamental value[233]. Hybridizes freely with other members of this genus[200]. **Special Features:**Not North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone: 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available.



and young flowering shoots can be cooked and eaten as a vegetable[7].

tcanta DyeA red dye is obtained from the root[7]. This was at one time used as a basis for some cosmetics[7].

dwatta Antitussive Depurative Diaphoretic Diuretic PoulitceThe whole plant is antitussive, depurative, diaphoretic and diuretic[7]. It is harvested when in flower and dried for later use. The dried and powdered herb is used as a poultice to treat inflammations[7]. Use internally with caution, the plant contains the alkaloid cynoglossine which can have a paralyzing effect[7].

propta Seed - sow spring in pots of sandy soil[200]. An overnight drop in temperature helps germination[133]. The seed usually germinates in 1 - 4 weeks at 21°c[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in early spring[200]. Root cuttings in autumn or early winter. Late winter is best[200].

nwatta Succeeds in most soils, preferring a sunny position[1, 111]. Prefers a fertile well-drained soil[111]. Tolerates heavy clay[200]. Requires a deep well-drained soil[187]. Established plants tolerate drought[187]. Plants are hardy to about -15°c[187]. The flowers are a good source of food for bees[1]. Many named forms have been selected for their ornamental value[187]. The plants tend to be short-lived perennials but they can be propagated by means of root cuttings[187].

## 4.2.196 Cymbalaria muralis

Kenilworth Ivy

3 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat m hkuc  
hmmic cyutli kyuctup hwicli hrasjutnyik hpa7tli flatprikliw  
hpa7tmwatli fyifxre7t hjonli

drutta Cymbalaria muralis is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw[4, 115, 177]. The leaves have been used in salads, being acid and pungent like cress[4]. We find them rather bitter and not very pleasant, though they are available all year round and so might be useful in the winter[K]. Some caution is advised, see the notes above on toxicity.

tcanta DyeA clear yellow dye is obtained from the flowers, though it is not very permanent[4, 115].

dwatta Antiscorbutic VulneraryThe herb is antiscorbutic and vulnerary[4, 7]. It is used externally as a poultice on fresh wounds to stop the bleeding[7]. There are reports that it has been used with success in India for the treatment of diabetes[4, 240].

propta Seed - surface sow March to June in a cold frame and do not exclude light. The seed usually germinates in 2 - 4 weeks at 18°c[164]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in late spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moderately good soil and some shade[1]. Plants usually self-sow freely[188] and can be invasive, especially when grown on old walls[200]. They succeed both on dry-stone walls and on old mortared walls[219].

## 4.2.197 Maianthemum dilatatum

Wild Lily Of The Valley, False lily of the valley

3 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasjutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta Maianthemum dilatatum is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA

hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for later use[118, 177]. The fruits are about the size of small peas and are produced in terminal clusters on the plants, they are not regarded very highly[256]. North American Indian children would eat the raw unripe green berries straight from the plant[256]. Adults would usually harvest the green berries and then store them in water until they turned red and were soft[256]. Alternatively they would dry the green berries and then boil them for a few minutes[256]. Young leaves - cooked[177].

tcanta None known

dwatta Infertility Ophthalmic Poulitce TBA poultice made of the whole or the mashed leaves has been applied to boils, burns, cuts and wounds[257]. The fruit has been used as a good medicine in the treatment of tuberculosis[257]. The root has been chewed in order to correct sterility[257]. (This probably means to restore fertility[K]) An infusion of the pounded roots has been used as a wash for sore eyes, whilst the chewed roots have been used as a poultice on the eyes[257].

propta Seed - best sown quite thinly it as soon as it is ripe in a cold frame, it should germinate in the spring. Stored seed should be sown in late winter in a cold frame, it might take 18 months to germinate. Allow the seedlings to grow on in the pot for their first year, giving liquid feeds as necessary to ensure that they do not go hungry. Divide the plants into individual pots once they have died down in late summer. Grow them on in pots for another year or more until large enough to plant out[K]. Division as new growth commences in the spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a cool shady moist but not wet position[1, 187]. Plants tolerate warm summers only if the soil remains moist[200]. A mat forming plant, it can be invasive in good conditions[200].

## 4.2.198 Aster macrophyllus

Bigleaf Aster

3 tlin 7 cyuc 2 kcaak 2 tcan 1 dwat m hkuc  
hmmihtut cyutli kyuctup hwicli hrasjutnyik hpa7tli flat-  
prikliw hpa7tmwatli fyifxre7t hjonli

drutta Aster macrophyllus is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Very young leaves - cooked and used as a vegetable[46, 61, 105, 161, 177]. The leaves are said to act as a medicine as well as a food, though no details are given[257]. Only young leaves are eaten as old leaves quickly become tough[213]. Roots - cooked. They have been used in soups[257].

tcanta Plants can be used as a ground cover in light shade, forming a spreading clump[208, 233].

dwatta Blood purifier Laxative VDThe roots have been used as a blood medicine[257]. An infusion of the root has been used to bathe the head to treat headaches[257]. A compound decoction of the roots has been used as a laxative in the treatment of venereal disease[257].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring

(sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Inner bark MannaEdible Uses: Inner bark - it can be eaten raw or can be dried, ground into a powder and used with cereal flours in making bread etc[2, 177]. A sweet-tasting manna is obtained from the trunk, it can be eaten raw but is mainly used medicinally[2, 7, 46, 61, 105]. Another report says that 'Briancon manna' is exuded from the leaves in the summer[4]. It is white, sweet and almost odourless[4].

tcanta Pioneer Resin Tannin WoodLarge quantities of resin are obtained by tapping the trunk[4]. Small holes are bored into the trunk, most resin being obtained from near the centre of the trunk[171]. When properly made, the same borehole can be used for 20 - 30 years[64]. The resin has a wide range of uses including wood preservatives, varnish, medicinal etc[4, 64]. It needs no preparation other than straining through a cloth to remove plant debris etc[4]. The hole is made in the spring and the resin extracted in the autumn[64]. Resin can be extracted from May to October[4]. The yield is about 40 grams per tree[64]. A fast-growing tree that establishes itself rapidly and is also said to improve the quality of the soil, the larch can be used as a pioneer species on cleared and exposed land in order to assist the establishment of other woodland trees[4]. The bark contains tannin[171]. This is much utilized in N. Europe[223], though in Britain the oak is considered to be a better source[4]. On a 10% moisture basis, the bark contains 11.6% tannin[223]. Wood - durable, tough, elastic, easy to split, takes a good polish[4, 46, 61, 81]. Larch produces one of the toughest woods obtained from conifers and is also resistant to woodworm[4]. It is widely used in construction, for railway sleepers, cabinet work etc[4, 46, 61, 81].

dwatta Anthelmintic Antidote Antirheumatic Antiseptic Astringent Bach Balsamic Diuretic Eczema Expectorant Haemostatic Laxative Rubefacient Stimulant Vermifuge VulneraryThe bark, stripped of its outer layer, is astringent, balsamic, diuretic, expectorant, stimulant and vulnerary[4, 21]. Its main application is as an expectorant in chronic bronchitis and has also been given internally in the treatment of haemorrhage and cystitis[4, 238]. A cold extract of the bark is used as a laxative[9]. As an external application, it is useful in the treatment of chronic eczema and psoriasis[4]. The powdered bark can be used on purulent and difficult wounds to promote their healing[21]. The bark is harvested in the spring and should be dried rapidly[4]. The turpentine obtained from the resin is antiseptic, balsamic, diuretic, haemostatic, rubefacient and vermifuge[4, 238]. It is a valuable remedy in the treatment of kidney, bladder and rheumatic affections, and also in diseases of the mucous membranes and the treatment of respiratory complaints[4]. Other reports say that it is contraindicated for anyone with a kidney complaint[7, 238]. Externally, the turpentine is used in the form of liniment plasters and inhalers[4]. It has also been suggested for combating poisoning by cyanide or opium[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Lack of confidence', 'Anticipation of failure' and 'Dependancy'[209]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Larix decidua for fevers and colds, coughs/bronchitis, tendency to infection, blood pressure problems, inflammation of mouth and pharynx, common cold (see [302] for critics of commission E).

propta Seed - sow late winter in pots in a cold frame. One month cold stratification helps germination[113]. It is best to give the seedlings light shade for the first year[78]. As soon as they are large enough to handle, prick out the seedlings into individual pots. Although only a few centimetres tall, they can be planted out into their permanent positions in the summer providing you give them an effective weed-excluding mulch and preferably some winter protection for their first year. Otherwise grow them on in the cold frame for their first winter and plant them out in early summer of the following year. The seed remains viable for 3 years[113] If you are growing larger quantities of plants, you can sow the seed in an outdoor seedbed in late winter. Grow on the seedlings in the seedbed for a couple of years until they are ready to go into their permanent positions then plant

them out during the winter.

nwatta Landscape Uses:Specimen. Prefers an open airy position in a light or gravelly well-drained soil[11, 200]. It tolerates acid and infertile soils, though it dislikes very peaty or very chalky soils[11]. Another report says that it tolerates chalky soils[200]. Succeeds on rocky hill or mountain sides and slopes[200]. Tolerates salt-laden gales according to one report[75] whilst another says that it dislikes exposed positions[11]. The larch dislikes atmospheric pollution and so does not grow well in towns[185]. A north or east aspect is more suitable than west or south[11]. It dislikes growing in wet ground or frost pockets[11, 81], and grows best in areas with abundant rainfall[11]. The larch is a very ornamental tree that is widely grown for forestry[11, 81]. It is very fast growing with new annual growth of 1.5 metres often found and trees can average 60cm or more for many years[185]. The dormant trees are very cold hardy, but they are often excited into premature growth in Britain by mild spells during the winter, the plants are then subject to damage by late frosts and cold winds[1, 185]. The young shoots have a delicate mossy fragrance as the leaves unfold[245]. Hybridizes freely with other members of this genus. Open ground plants, 1 year x 1 year are the best for planting out, do not use container grown plants with spiralled roots[200]. Plants transplant well, even when coming into growth in the spring[200]. Plants in this genus are notably resistant to honey fungus[81, 200]. Special Features:Not North American native, Attractive flowers or blooms.

## 4.2.140 Parthenocissus quinquefolia

Virginia Creeper, Woodbine

3 tlin 10 cyuc 2 kcaak 0 tcan 2 dwat 30 m hkuc  
hmmihtut cyutli tcup hwicli hrasjutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta Parthenocissus quinquefolia is a deciduous Climber growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit Root StemEdible Uses: Fruit - raw[105, 161]. The fruit is not very well flavoured, nor is it produced very freely[K]. The fruit is about 6mm in diameter[200] and is carried in small bunches like grapes[K]. Stalks - cooked. They should be peeled and then boiled[105, 161]. The stalks are cut, boiled and peeled, and the sweetish substance between the bark and the wood is used for food[257]. Root - cooked[257].

tcanta DyeA pink dye is obtained from the fruit[46, 61, 257]. The plant can be allowed to fall down banks and make a spreading ground cover[202]. They are best spaced about 3 metres apart each way[208]. They are very vigorous, however, and would soon swamp smaller plants[K].

dwatta Alterative Astringent Diuretic Expectorant TonicThe bark and fresh young shoots are aperient, alterative, emetic, expectorant and tonic[46, 61]. A hot decoction can be used as a poultice to help reduce swellings[257]. A tea made from the leaves is aperient, astringent and diuretic[222]. It is used as a wash on swellings and poison ivy rash[222, 257]. A tea made from the plant is used in the treatment of jaundice[222, 257]. A tea made from the roots is used in the treatment of gonorrhoea and diarrhoea[222, 257]. The fruit is useful in treating fevers[4]. Some evidence suggests the berries (due to oxalic acid content)are poisonous[301].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed requires stratifying for 6 weeks at 5°c and should be sown as early in the year as possible[200]. Germination is variable. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm taken at a node (ensure that it has at least 2 true buds), July/August in a frame[78]. Easy to root but they do not always survive the first winter[182]. Basal hardwood

cuttings of current seasons growth, 10 - 12 cm long, autumn in a frame[200]. Layering[200]. Plants often self-layer[202].  
 nwatta Landscape Uses:Arbor, Woodland garden. Requires a well-drained moisture retentive fertile soil[200]. Succeeds in most soils, preferring full sun but tolerating semi-shade[202]. Best if grown in semi-shade on an east or west facing wall[200]. Tolerates atmospheric pollution[4]. Dormant plants are hardy to about -25°C[200], though the young growth in spring can be damaged by late frosts. A very ornamental plant[1], it is self-supporting on walls by means of adhesive tendrils[11, 182]. Very fast growing, though it often does not grow very much in its first year or two after planting out[202]. When established, it can send out new growth 6 metres long in a year[4]. The plant can, however, become a nuisance by climbing into gutters[182]. Plants are very tolerant of trimming and can be cut right back to the base if required to rejuvenate the plant[202]. Any pruning is best carried out in the spring[219]. The fruit is normally only produced after a long hot summer[219]. There are several named varieties[182]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

### 4.2.141 Populus deltoides

Eastern Cottonwood, Plains cottonwood, Rio Grande cottonwood, Necklace Poplar  
 3 tin 9 cyuc 2 kcaak 4 tcan 2 dwat 30 m hkuc  
 htut cyuti tcup hwicli hrasjutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli  
 drutta Populus deltoides is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from March to April, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Inner bark Leaves SeedEdible Uses: Inner bark[105, 161, 177, 257]. A mucilaginous texture, it is usually harvested in the spring[257]. There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread. Seeds[105, 161, 177]. No more details are given but they are very small and would be exceedingly fiddly to collect and use. Sap - used for food[257]. Buds[105, 161, 177]. No more details are given. The leaves are rich in protein and have a greater amino-acid content than wheat, corn, rice and barley[226]. A concentrate made from them is as nourishing as meat, but can be produced faster and more cheaply[226]. Some people believe that this will become a major food source for humans[226].

tcanta Biomass Dye Pioneer Rooting hormone Shelterbelt Soil stabilization WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. Various dyes can be obtained from the leaf buds in the spring - green, white, yellow, purple and red have been mentioned[257]. Trees are planted for dune fixing in erosion control programmes[149, 227]. They are also good pioneer species, growing quickly to provide a good habitat for other woodland trees and eventually being out-competed by those trees[229]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200, 269]. Another report says that it is easily storm-damaged[227]. The wood has been used as a bio-mass for producing methanol, which can be used to power internal combustion engines[226]. Annual yields of 7 tonnes of oven-dry material per year have been achieved[269]. Wood - weak, soft, rather woolly in texture, though not smell or taste, of low flammability, not durable, very resistant to abrasion but warps and shrinks badly[11, 149, 171, 227]. It weighs 24lb per cubic foot[235]. The wood takes paint well, is easy to glue and nail[227]. It is used principally for lumber, pulp, crates, veneer etc[11, 149, 171].

dwatta Anodyne Anthelmintic Antiinflammatory Antiscorbutic Blood purifier Febrifuge Poulitice TonicThe bark contains salicin, a glycoside that probably decomposes into

salicylic acid (aspirin) in the body[222, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238]. An infusion of the bark has been used in the treatment of whooping cough and tuberculosis[257]. A decoction of the bark has been used to rid the body of intestinal worms[257]. The bark has been eaten as a treatment for colds[257]. A tea made from the inner bark is used in the treatment of scurvy[222]. The inner bark, combined with black haw bark (Crataegus douglasii) and wild plum bark (Prunus spp) has been used as a female tonic[222, 257]. A poultice of the leaves has been used as a treatment for rheumatism, bruises, sores and boils[257].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta Industrial Crop: Biomass Management: Copypice Management: Standard Minor Global Crop Other Systems: Irreg. Intercrop Other Systems: Strip intercropLandscape Uses:Erosion control, Aggressive surface roots possible. An easily grown plant, it does well in a heavy cold damp soil[1, 269] but thrives best on moist well-drained, fine sandy loams or silts close to streams[269]. Prefers a deep rich well-drained circumneutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It does not do well in exposed upland sites[11]. It dislikes shade and is intolerant of root or branch competition[200]. Tolerates both hot and cool summers[200]. Fairly wind-tolerant[200]. The tree is reported to tolerate an annual precipitation in the range of 60 to 150cm, an annual temperature in the range of 8 to 14°C, and a pH of 4.5 to 8[269]. A fast-growing but short-lived tree[227, 229, 274]. It can make new shoots up to 1.5 metres long each year[274] and is often planted for timber in Europe[50]. It does have drawbacks, though, since it is easily storm-damaged, is easily damaged by fire when young and is much attacked by fungi[227]. Like the quaking aspen (Populus tremuloides) the leaves of this species rustle even in light breezes[274]. The trees can be coppiced[149], sprouting freely from the base of the trunk and the roots if they are cut down[227]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200]. Special Features: North American native, Naturalizing, Wetlands plant, Inconspicuous flowers or blooms.

### 4.2.142 Pinus sylvestris

Scot's Pine, Scotch Pine  
 3 tin 7 cyuc 2 kcaak 5 tcan 3 dwat 25 m hkuc  
 hmimhtut cyuti hgatkuyctuphja7n hwicli hyishrasjlut hpa7tli frusflatprikliwssilp hpa7tmwatli dyat hjonli

drutta Pinus sylvestris is an evergreen Tree growing to 25 m (82ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower in May, and the seeds ripen from March to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very al-

of internal haemorrhage, uterine bleeding, mumps and feverish illnesses[238]. The root is harvested in the autumn and can be dried for later use[7]. This remedy should be used with caution and only under the supervision of a qualified practitioner[21, 238]. The root is toxic and the dosage is critical[238]. Pregnant women and people with heart complaints should not be prescribed this plant[7]. See also notes above on toxicity. Externally, the root is used as a poultice in the treatment of abscesses, boils, carbuncles and sores[238, 268].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Rock garden, Specimen, Woodland garden. Prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Succeeds in poor soils[208]. Succeeds in full sun but grows best in a shady position with only 2 - 3 hours sun per day[200]. Tolerates a pH range from 4.5 to 7[200]. Dislikes heavy clay[1]. Prefers a good supply of water at its roots[1] but succeeds in dry shade[28] and tolerates drought when it is established[200]. A very hardy plant, tolerating temperatures down to about -30°C[200], the plant remains evergreen in the milder areas of Britain[233]. Members of this genus are rarely if ever troubled by browsing deer[233]. An aggregate species[17]. There are many named forms, selected for their ornamental value[187]. Special Features: Attractive foliage, North American native, Wetlands plant, Attracts butterflies, There are no flowers or blooms.

### 4.2.193 Aster cordifolius

Common Blue Wood Aster  
 3 tin 7 cyuc 2 kcaak 2 tcan 1 dwat 1.5 m hkuc  
 htut cyuti tcup hwicli hrasjutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Aster cordifolius is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - cooked and used as greens[207].

tcanta None known

dwatta Antirheumatic Aromatic NerveAn infusion of the plant is used as an aromatic nerve and also in the treatment of rheumatism[207].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. The seed usually germinates in 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. Prefers a rich soil[1]. Plants can be naturalized in a woodland or other wild garden[200]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

### 4.2.194 Bupleurum chinense

Bei Chai Hu  
 3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc  
 hmimhtut cyuti kyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Bupleurum chinense is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Rutin-Leaves and young shoots - cooked[2, 105, 177].The new growth in spring and autumn is used[178, 179]. It is a good source of rutin[179]. Root - cooked. A famine food, used when all else fails[177, 179].

tcanta FuelThe old plant is used as a fuel[178, 179].  
 dwatta Alterative Analgesic Antibacterial Antiinflammatory Antiperiodic Antipyretic Antiviral Carminative Diaphoretic Emmenagogue Haemolytic Malaria Pectoral SedativeBei chai hu root has been used in traditional Chinese medicine for at least 2,000 years[238]. It is a bitter herb that is used to harmonize the body, balancing the different organs and energies within the body[254]. It strengthens the digestive tract, acts as a tonic for the liver and circulatory system, lowers fevers and has anti-viral effects[238]. The root is alterative, analgesic, antibacterial, anti-inflammatory, antiperiodic, antipyretic, antiviral, carminative, diaphoretic, emmenagogue, haemolytic, hepatic, pectoral, sedative[116, 147, 174, 176, 178, 218, 238, 254]. It is taken internally in the treatment of malaria, blackwater fever, uterine and rectal prolapse, haemorrhoids, sluggish liver, menstrual disorders, abdominal bloating etc[238]. The roots are harvested in the autumn and can be used fresh or dried[238]. The root contains saikosides[254]. These saponin-like substances have been shown to protect the liver from toxicity whilst also strengthening its function, even in people with immune system disorders[254]. These saikosides also stimulate the body's production of corticosteroids and increase their anti-inflammatory affect[254]. The plant is often used in preparations with other herbs to treat the side effects of steroids[218].

propta Seed - sow spring in a cold frame. The seed usually germinates in 2 - 8 weeks at 15°C[138]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer or following spring. Division in spring. Very easy, larger clumps can be planted direct into their permanent positions. It is best to pot up smaller clumps and grow them on in a cold frame until they are well rooted before planting them out in the summer.

nwatta An easily cultivated plant[1], it succeeds in a sunny position in most fertile well-drained soils[138, 233, 238]. This species is closely related to B. falcatum, and is included in that species by some botanists.

### 4.2.195 Anchusa azurea

Anchusa, Italian bugloss  
 3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 1.5 m hkuc  
 htut cyuti hgattcup hwicli hrasjutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Anchusa azurea is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Flowers - raw. An excellent and decorative addition to the salad bowl, or used as a garnish[183]. The tender young leaves

drutta Secale vavilovii is a ANNUAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[105]. Used as a cereal for making bread, cakes, thickening soups and so on[K].

tcanta None known

dwatta None known

propta Seed - sow March or October in situ and only just cover the seed. Germination should take place within 2 weeks.

nwatta We have very little information on this species but it should succeed as an annual crop in Britain. It might be possible to sow it as an over-wintering annual. Succeeds in most soils but prefers a well-drained light soil in a sunny position[1].

## 4.2.191 *Urtica californica*

Stinging Nettle, California nettle

3 tlin 10 cyuc 2 kcaak 4 tcan 2 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Urtica californica* is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: DrinkYoung leaves - cooked[172]. A very nutritious food, high in vitamins and minerals, it makes an excellent spinach substitute and can also be added to soups and stews. Only use the young leaves and wear stout gloves when harvesting them to prevent getting stung. Although the fresh leaves have stinging hairs, thoroughly drying or cooking them destroys these hairs. Nettle beer is brewed from the young shoots[200].

tcanta Compost Dye Fibre Hair Liquid feed RepellentA strong flax-like fibre is obtained from the stems[200]. Used for making string and cloth, it also makes a good quality paper[115]. It is harvested as the plant begins to die down in early autumn and is retted before the fibres are extracted[4, 99]. The following uses have been listed for *U. dioica*, but they are almost certainly also applicable to this species. The plant matter left over after the fibres have been extracted are a good source of biomass and have been used in the manufacture of sugar, starch, protein and ethyl alcohol[4]. An oil obtained from the seeds is used as an illuminant[4]. An essential ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The leaves are also an excellent addition to the compost heap[12, 18, 20] and they can be soaked for 7 - 21 days in water to make a very nutritious liquid feed for plants[54]. This liquid feed is both insect repellent and a good foliar feed[14, 18, 53]. The growing plant increases the essential oil content of other nearby plants, thus making them more resistant to insect pests[18, 20, 54]. Although many different species of insects feed on nettles, flies are repelled by the plant so a bunch of freshly cut stems has been used as a repellent in food cupboard[s][4]. The juice of the plant, or a decoction formed by boiling the herb in a strong solution of salt, will curdle milks and thus acts as a rennet substitute[4]. This same juice, if rubbed into small seams of leaky wooden tubs, will coagulate and make the tub watertight again[4]. A hair wash is made from the infused leaves and this is used as a tonic and antidandruff treatment[172, 201]. A beautiful and permanent green dye is obtained from a decoction of the leaves and stems[4, 115]. A yellow dye is obtained from the root when boiled with alum[4, 115].

dwatta AntirheumaticThe fresh leaves of nettles have been rubbed or beaten onto the skin in the treatment of rheumatism etc[K]. This practice, called urtification, causes intense irritation to the skin as it is stung by the nettles. It is believed that this treatment works in two ways. Firstly, it acts as a counter-irritant, bringing more blood to the area to help remove the toxins that cause rheumatism. Secondly, the formic acid from the nettles is believed to have a beneficial effect upon the rheumatic joints.

propta Seed - sow spring in a cold frame, only just covering the seed. Prick out the seedlings into individual pots when they are large enough to handle, and plant them out in the summer. Division succeeds at almost any time in the growing season. Very easy, plant them straight out into their permanent positions.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of the country. It is very closely related to *U. lyallii* and is doubtfully distinct from it[71]. The Flora of North America treats this taxon as no more than a synonym of *Urtica dioica gracilis*[270]. The following notes are based on the general needs of the genus. Prefers a nitrogen-rich soil[200]. The best fibre is produced when plants are grown on deep fertile soils[200]. Dioecious. Male and female plants must be grown if seed is required. Note: *Urtica californica* Greene is a synonym of *Urtica dioica* subsp. *gracilis* (Aiton) Selander For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.192 *Dryopteris filix*

Male Fern

3 tlin 8 cyuc 2 kcaak 0 tcan 4 dwat 1.2 m hkuc

hmim cyutli hgakyuctcup hwicli hyishrasljutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Dryopteris filix-mas* is an evergreen Fern growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, and the seeds ripen from July to September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves RootEdible Uses: Young fronds - cooked[105, 177]. A flavour resembling asparagus, broccoli and artichokes[142]. Some caution is advised, see the notes above on toxicity. The rhizomes can be eaten raw or cooked[257]. They were eaten raw as part of a regime for losing weight[257].

tcanta Compost Potash TanninA compost of fern leaves is very beneficial on tree seed beds, aiding germination[20]. The ashes of the plant are rich in potash and has been used in making soap and glass[4]. An effective ground cover plant. Although it is usually deciduous, its decaying fronds make a good weed-suppressing mulch in the winter[200]. Space the plants about 60cm apart each way[208]. The roots contain about 10% tannin[223].

dwatta Anodyne Antibacterial Antinflammatory Antirheumatic Antiviral Astringent Febrifuge Vermifuge VulneraryThe male fern is one of the most popular and effective treatments for tape worms. The root stalks are anodyne, antibacterial, anti-inflammatory, antiviral, astringent, febrifuge, vermifuge and vulnerary[7, 9, 13, 19, 21, 171, 178, 218, 238]. The root contains an oleoresin that paralyses tapeworms and other internal parasites and has been used as a worm expellent[222, 238]. The active ingredient in this oleoresin is 'filicin', roots of this species contain about 1.5 - 2.5% filicin[240]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate, *Convulvulus scammonia* or *Helleborus niger* in order to expel the worms from the body[7, 238, 254]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is also taken internally in the treatment

of alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: ConditionInner bark - dried and ground into a powder and used in making bread[2, 66, 105, 177]. It is often mixed with oatmeal[115]. A famine food, it is only used when all else fails[115]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Essential Fibre Fuel Herbicide Lighting Packing Resin Shelterbelt WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. A reddish yellow dye is obtained from the cones[6]. This tree yields resin and turpentine[64, 66, 100, 171]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. An essential oil obtained from the leaves is used in perfumery and medicinally[46, 61]. A fibre from the inner bark is used to make ropes[115]. The roots are very resinous and burn well. They can be used as a candle substitute[115]. The leaves are used as a packing material[46]. The fibrous material is stripped out of the leaves and is used to fill pillows, cushions and as a packing material[7]. Trees are very wind resistant and quite fast growing. They can be planted as a shelterbelt, succeeding in maritime exposure[75, 200]. Wood - light, soft, not strong, elastic, durable, rich in resin. Used in construction, furniture, paper manufacture etc.[13, 46, 100]. A good fuel but it is somewhat smoke[y]6, 66, 115].

dwatta Antirheumatic Antiseptic Aromatherapy Bach Balsamic Diuretic ExpectorantScot's pine has quite a wide range of medicinal uses, being valued especially for its antiseptic action and beneficial effect upon the respiratory system. It should not be used by people who are prone to allergic skin reactions whilst the essential oil should not be used internally unless under professional supervision[254]. The turpentine obtained from the resin is antirheumatic, antiseptic, balsamic, diuretic, expectorant, rubefacient and vermifuge[4, 13, 46]. It is a valuable remedy in the treatment of kidney, bladder and rheumatic affections, and also in diseases of the mucous membranes and the treatment of respiratory complaints[4]. Externally it is used in the form of liniment plasters and inhalers[4]. The leaves and young shoots are antiseptic, diuretic and expectorant[9]. They are harvested in the spring and dried for later use[9]. They are used internally for their mildly antiseptic effect within the chest and are also used to treat rheumatism and arthritis[254]. They can be added to the bath water for treating fatigue, nervous exhaustion, sleeplessness, skin irritations[9]. They can also be used as an inhalant in the treatment of various chest complaints[9]. The essential oil from the leaves is used in the treatment of asthma, bronchitis and other respiratory infections, and also for digestive disorders such as wind[254]. An essential oil obtained from the seed has diuretic and respiratory-stimulant properties[254]. The seeds are used in the treatment of bronchitis, tuberculosis and bladder infections[254]. A decoction of the seeds can be applied externally to help suppress excessive vaginal discharge[254]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Self-reproach', 'Guilt feelings' and 'Despondency'[209]. The essential oil is used in aromatherapy. Its keyword is 'Invigorating'[210].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have

a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional TimberLandscape Uses:Christmas tree, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Trees grow well on poor dry sandy soils[11, 81]. Fairly shade tolerant[186]. Prefers a light acid soil, becoming chlorotic at a pH higher than 6.5[186]. Trees can succeed for many years on shallow soils over chalk[185]. Tolerates chalk for a while, but trees are then short-lived[81]. Tolerates some water-logging[186]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[186]. Very wind resistant[49, 75], tolerating maritime exposure[166]. Tolerates atmospheric pollution[226]. Fairly long-lived, to 200 years or more and quite fast growing[185], but trees are very slow growing in wet soils[81]. Young trees can make new growth of 1 metre a year though growth slows down rapidly by the time the tree is 18 metres tall[185]. This species is extensively used in cool temperate forestry as a timber tree[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Cones take two seasons to ripen[7]. Plants are easily killed by fire and cannot regenerate from the roots[186]. A good food plant for the caterpillars of several species of butterflies[30]. This tree has over 50 species of associated insects[81]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. There are several named forms selected for their ornamental value[188]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 4.2.143 *Ulmus americana*

American Elm, Gray Elm, Water Elm

3 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ulmus americana* is a deciduous Tree growing to 25 m (82ft) by 25 m (82ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: CoffeeLeaves - raw or cooked. The red inner bark has been used to make a coffee-like drink[257].

tcanta Containers Paper String WoodA fibre obtained from the stems is used in making paper[189]. The stems are harvested in spring, the leaves are removed and the stems steamed until the fibres can be stripped. The outer bark is removed from the inner bark by scraping or peeling. The fibres are cooked for 2 hours with lye and then beaten with mallets. The paper is beige in colour[189]. The inner bark is very fibrous and is used in making string and strong ropes[149, 226]. The bark has been used to make various containers, including those used for gathering maple syrup[226]. Wood - hard, strong, heavy, durable, coarse grained, shrinks moderately though it tends to warp and twist, it bends well and is difficult to split. The wood is very durable in water. It weighs 40lb per cubic foot and is harvested commercially for flooring, wheel hubs, cooperage, agricultural implements and many other uses[46, 61, 82, 149, 171, 226, 227].

dwatta Antispasmodic Astringent Birthing aid Dysentery Haemostatic SalveAn infusion made from the bark has been used in the treatment of bleeding from the lungs, rупres, coughs, colds, influenza, dysentery, eye infections, cramps and diarrhoea[226, 257]. An infusion of the bark has been taken by pregnant women to secure stability of children[257]. A decoction of the bark has been used as a wash on wounds[257]. A decoction of the inner bark has been taken in the treatment of severe coughs, colds, menstrual cramps[257]. An infusion of the inner bark has been drunk, and used as a bath, in the treatment of appendicitis[257]. An infusion of the root bark has been used in the treatment of coughs, colds and excessive menstruation[257]. A decoction has been used as an eye wash in the treatment of sore eyes[257]. The inner bark has been used as an emollient on tumours[257].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Landscape Uses:Firewood, Aggressive surface roots possible, Specimen, Street tree. Prefers a fertile soil in full sun[188], but it can be grown in any soil of at least moderate quality so long as it is well drained[1]. Trees are moderately fast-growing and live for at least 300 years in the wild[227, 229], but they do not thrive in Britain[1]. This species is particularly susceptible to 'Dutch elm disease'[274], a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. Mature trees killed back by the disease will often regrow from suckers, but these too will succumb when they get larger. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. Special Features:North American native, Inconspicuous flowers or blooms.

## 4.2.144 Acer platanoides

Norway Maple, Harlequin Maple

3 tlin 7 cyuc 2 kcaak 3 tcan 0 dwat 21 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikli-wisslip hpa7tmwatli hjonli

drutta Acer platanoides is a deciduous Tree growing to 21 m (69ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: SapEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[4, 105, 177]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (A. saccharum)[2]. The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta Dye Preservative Shelterbelt WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. The trees are fairly wind tolerant and are often used in to give protection from the wind in mixed shelterbelts[200]. They are fast-growing and rapidly produce a screen[200]. A rose coloured dye is obtained from the bark[57]. Wood - hard, heavy, fine grained. Used for small domestic items[4, 13, 46, 61].

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Cultivars can be budded onto rootstocks of the species. Any grafting is best carried out in September rather than February.

nwatta Landscape Uses:Firewood, Aggressive surface roots possible, Pollard, Screen. Of easy cultivation, it prefers a good moist well-drained soil but thrives in any soil[11, 17]. Grows well in heavy clay soils. Prefers a sunny position but tolerates some shade[11, 200]. One report says that plants tolerate chalky soils[200], but another says that plants can develop chlorosis as a result of iron deficiency when they are grown in alkaline soils. Trees are very tolerant of atmospheric pollution[226]. The Norway maple is a quick-growing tree that has been widely planted in Britain and is more or less naturalized. There are many named forms that have been selected for their ornamental value[11]. Norway maple is a bad companion plant, inhibiting the growth of nearby plants[18, 20]. The leaves are seldom eaten or defaced by insects because the tree contains a sharp milky juice that they dislike[4]. Trees take 30 years to produce seed[98]. Special Features: Not North American native, Invasive, Naturalizing, Attractive flowers or blooms.

## 4.2.145 Picea pungens

Blue Spruce, Colorado Spruce

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc htut cyutli kyuctup hwicli hyishrasjlutnyik hpa7tli frusflat-prik hpa7tmwatli hjonli

drutta Picea pungens is an evergreen Tree growing to 20 m (65ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are about 7cm long[82]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw[172]. The seed is about 2 - 4mm long[229]. It is rich in fats and has a pleasant slightly resinous flavour but is too small and fiddly to be worthwhile unless you are desperate[172, K]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Prefers a moderately fertile deep moisture-retentive well-drained loam and a position in semi-shade but also succeeds in a sunny position[200]. Requires a sheltered position[200]. Plants are hardier when grown on poorer soils[200]. This species is especially tolerant of poor dry soils[200]. Prefers an acid soil[184]. Dormant plants are hardy to at least -15°C[184, 200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The whole plant has an unpleasant smell[4]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.188 Chrysothamnus viscidiflorus

Green Rabbitbrush, Yellow rabbitbrush

3 tlin 7 cyuc 2 kcaak 2 tcan 1 dwat 1 m hkuc htut cyutli hgatkycuctup hwicli hyishrasjlut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Chrysothamnus viscidiflorus is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: Condiment GumA latex obtained from the root is used as a chewing gum[46, 61, 105, 257]. The plant has been used as a spice[257].

tcanta Dye Gum LatexThe latex obtained from the roots could be used in making rubber[46, 61, 161, 177]. Unfortunately it is not produced in sufficient quantity to make commercial extraction worthwhile[K]. A green dye is obtained from the bark[168]. A yellow-gold dye is obtained from the flowers[168, 257]. It is orange when alum is used as a mordant[257]. It rapidly establishes in disturbed habitat, including burns, flooded washes, and rockslides, so it is a valuable shrub for revegetating damaged land such as overgrazed rangeland and abandoned mining areas.

dwatta Antirheumatic Odontalgic PoulticeA poultice made from the chewed plant tips has been applied to boils and rheumatic joints[257]. An infusion of the leaves has been used to treat colds[257]. The finely mashed leaves have been inserted in tooth cavities to treat toothache[257].

propta Seed - we have no information for this species but suggest sowing the seed in spring in a greenhouse and only just covering the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in sand in a frame[200].

nwatta Requires a sunny position and prefers a well-drained sandy soil[1, 11]. Plants do not require a rich soil[11]. They tolerate alkaline soils[200]. A very hardy plant but it prefers a drier climate than it finds in Britain though it succeeds in this country if given the protection of a dry sunny wall[200]. A very variable and ornamental species[60]. The leaves and stems are pleasantly aromatic[219].

## 4.2.189 Leonurus cardiaca

Motherwort, Common motherwort

3 tlin 7 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Leonurus cardiaca is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: Condiment TeaThe fresh or dried flowers can be used as a flavouring in soups, particularly lentil or split pea[183]. They are also used as a flavouring in beer[183]. Fresh or dried flowers can be used to make a tea[183].

tcanta DyeA dark olive-green dye is obtained from the leaves[46, 61, 145].

dwatta Antiarrhythmic Antiflatulent Antispasmodic Astringent Birthing aid Cardiac Diaphoretic Emmenagogue Homeopathy Nerve Sedative Stomachic Tonic Women's complaintsMotherwort is especially valuable in the treatment of female weaknesses and disorders, allaying nervous irritability, inducing quiet and passivity of the whole nervous system[4]. It is also seen as a remedy for heart palpitations, it has a strengthening effect, especially on a weak heart[254]. The antispasmodic and sedative effects promote relaxation rather than drowsiness[254]. The leaves are antispasmodic, astringent, cardiac, diaphoretic, emmenagogue, nerve, sedative, stomachic, tonic and uterine stimulant[4, 9, 21, 46, 165, 222]. They are taken internally in the treatment of heart complaints (notably palpitations) and problems associated with menstruation, childbirth and menopause, especially of nervous origin[238]. Although an infusion can be used, the taste is so bitter that the plant is usually made into a conserve or syrup[244]. An alcoholic extract is said to possess superior action to valerian (Valeriana officinalis)[240]. The plant has been found effective in the treatment of functional heart complaints due to autonomic imbalance, and also as an anti-thyroid treatment, though it needs to be taken for several months for these effects to be noticed[244]. The whole herb is harvested in August when in flower and can be dried for later use[4]. It should not be prescribed in the earlier stages of pregnancy or where periods are heavy[238, 254]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of heart complaints, amenorrhoea, menopausal problems and flatulence[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Leonurus cardiaca Motherwort for nervous heart complaints (see [302] for critics of commission E).

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. If you have sufficient seed then it can be sown in an outdoor seedbed, or even in situ. Division in spring or autumn[238]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant that succeeds in most soils[4], preferring one on the poor side[108]. This plant was at one time cultivated for its medicinal uses[4]. The whole plant is deliciously pungent when handled[245]. The plant often self-sows when well-sited[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 4.2.190 Secale vavilovii

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Galium aparine is a ANNUAL growing to 1.2 m (4ft) by 3 m (9ft 10in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Coffee TeaThe tender young shoot tips - raw or cooked as a pot-herb[5, 7, 53, 55, 62, 172, 183]. A rather bitter flavour that some people find unpalatable[244], they are best used in the spring[178]. They make a useful addition to vegetable soups[7, 244]. It is said that using this plant as a vegetable has a slimming effect on the body[238]. The roasted seed is a coffee substitute[2, 53, 62]. One of the best substitutes, it merely needs to be dried and lightly roasted and has much the flavour of coffee[4, 115, 183]. A decoction of the whole dried plant gives a drink equal to tea[2, 4].

tcanta Cleanser Dye Filter TindaA red dye is obtained from a decoction of the root[4, 7, 168]. When ingested it can dye the bones red[4]. The dried plant is used as a tincture[99]. The plant can be rubbed on the hands to remove pitch (tar)[99]. The stems are placed in a layer 8cm or more thick and then used as a sieve for filtering liquids[4, 115, 172].

dwatta Alternative Antiphlogistic Aperient Astringent Cancer Depurative Diaphoretic Diuretic Eczema Febrifuge Homeopathy Skin Tonic VulneraryGoosegrass has a long history of domestic medicinal use and is also used widely by modern herbalists. A valuable diuretic, it is often taken to treat skin problems such as seborrhoea, eczema and psoriasis, and as a general detoxifying agent in serious illnesses such as cancer[254]. The whole plant, excluding the root, is alterative, antiphlogistic, aperient, astringent, depurative, diaphoretic, diuretic, febrifuge, tonic and vulnerary[4, 7, 9, 21, 165, 218, 222]. It is harvested in May and June as it comes into flower and can be used fresh or dried for later use[4, 238]. It is used both internally and externally in the treatment of a wide range of ailments, including as a poultice for wounds, ulcers and many other skin problems[4, 7, 244], and as a decoction for insomnia and cases where a strong diuretic is beneficial[4]. It has been shown of benefit in the treatment of glandular fever, ME, tonsillitis, hepatitis, cystitis etc[238]. The plant is often used as part of a spring tonic drink with other herbs[4]. A tea made from the plant has traditionally been used internally and externally in the treatment of cancer[4, 218, 222]. One report says that it is better to use a juice of the plant rather than a tea[254]. The effectiveness of this treatment has never been proved or disproved[7]. Both Asperuloside (a terpenoid) and Coumarin (a benzopyrone) occur in some species of Galium. Asperuloside can be converted into prostaglandins (hormone-like compounds that stimulate the uterus and affect blood vessels), making the genus of great interest to the pharmaceutical industry[238]. A homeopathic remedy has been made from the plant[7].

propta Seed - best sown in situ as soon as the seed is ripe in late summer[200]. The seed can also be sown in spring though it may be very slow to germinate[200]. Once established, this plant does not really need any help to reproduce itself.

nwatta Prefers a loose moist leafy soil in some shade[200]. Plants tolerate dry soils, but they quickly become scorched when growing in full sun[200]. They do not thrive in a hot climate[200]. Another report says that plants succeed in most soils in full sun or heavy shade. A scrambling plant, the stems and leaves are covered with little hooked bristles by which it can adhere to other plants and climb into them[4]. A good species to grow in the wild garden, it provides food for the larvae of many butterfly species[30].

## 4.2.186 Polygonatum sibiricum

Huang Jing  
3 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc  
pcimhmm cyuti tcup hwicli hrasjutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta Polygonatum sibiricum is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[105, 176]. They can be used as an asparagus substitute. Root - cooked[105, 176]. Rich in starch.

tcanta Insecticide MiscellanyThe plant has insecticidal properties[218].

dwatta Antibacterial Antifungal Antirheumatic Demulcent Lenitive Miscellany TonicThe root is antibacterial, antifungal, antirheumatic, antiseptic, demulcent, lenitive, tonic and vasodilator[176, 218]. Its use lowers the blood pressure and prevents atherosclerosis and fatty infiltration in the liver[176]. It is used in the treatment of dry coughs due to chronic bronchitis and pulmonary tuberculosis, fatigue and poor appetite[176].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. This species is closely related to *P. verticillatum*[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs[K]. Plants adopt a semi-climbing habit, scrambling through small shrubs[187]. Hybridizes with other species in this genus.

## 4.2.187 Aralia hispida

Bristly Sarsaparilla  
3 tlin 7 cyuc 2 tcan 1 dwat 1 m hkuc  
hmimhtu cyuti kyuctcup hwicli hyishrasjutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Aralia hispida is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Drink TeaA tea is made from the roots[183]. The roots are also used for making 'root beer'[183].

tcanta Wildlife shelter. Nectary shelter [1-2].

dwatta Alternative Cardiac Diaphoretic Diuretic TonicA tea made from the leaves is diaphoretic[222]. The root is alterative and tonic[257]. An infusion of the root has been used in the treatment of heart diseases[257]. The bark, and especially the root bark, is diuretic and tonic[4, 222]. A homeopathic remedy is made from the fresh root[4]. It has alterative, diaphoretic and diuretic properties and is considered to be a good treatment for dropsy[4].

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into

tcanta Shelterbelt WoodA fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - light, soft, close grained, weak, brittle and often full of knots[82, 171, 229]. The wood has little commercial value[226], but is used for construction[82] and is also valued for its use in the pulp industry to make paper[171].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Christmas tree, Firewood, Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Prefers a cold dry high mountain site[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[11]. Resists wind exposure to some degree[200]. This species has a deeply penetrating root system that firmly anchors the tree against winds[229]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. A long-lived but slow-growing tree in the wild, with specimens 800 years old recorded[229]. It is planted as a timber tree in N. and C. Europe[50]. Most trees in Britain are grafted and these are slow growing[185]. The few trees of seedling origin tend to be fairly fast growing after a slow start[185]. Annual increases of 30 - 40cm are not uncommon in some of the larger trees. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Seed production is usually good, with heavy crops every 2 - 3 years[229]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. There are several named forms, selected for their ornamental value[188]. Trees are very subject to severe damage by aphids in mild winter areas where temperatures do not regularly fall below -8°C[200]. All parts of the plant emit a powerful pungent smell when bruised[245]. Special Features:Attracts birds, Attractive foliage, North American native, Inconspicuous flowers or blooms.

## 4.2.146 Juniperus virginiana

Pencil Cedar, Eastern redcedar, Southern redcedar, Silver Cedar, Burk Eastern Red Cedar, Silver East  
3 tlin 9 cyuc 2 kcaak 4 tcan 2 dwat 20 m hkuc  
htut cyuti hgatkyuctcup hwicli hrasjutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Juniperus virginiana is an evergreen Tree growing to 20 m (65ft) by 8 m (26ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 4. It is in leaf all year; in flower from April to May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[106]. A sweetish resinous flesh[82]. They can be crushed and used as a flavouring in soups and stews[257]. The cones are about 5mm in diameter[200]. About 10mm according to another report[226]. A tea is made from the fruit[159]. It is not very nice[159]. It is made from the young branches and the fruit according to one report[183].

tcanta Essential Insecticide Repellent Shelterbelt TindaWoodAn essential oil is obtained from the wood[1, 46, 57, 61]. Composed of cedar camphor or cedrol[213], it is used in soaps, as an insecticide and moth repellent[61, 213], a deodorant, in polishes, perfumery etc[4, 21]. Chips of the wood have been used as moth repellents[269]. The leaves are used as an incense[46, 213] and are also either burnt or crushed and then scattered around as an insect repellent[169, 257]. The crushed bark can be used as a soft base in candles[257]. The bark has also been cut into strips and used to make mats[257, 269]. The red inner bark is a source of a red dye[269]. The bark of the tree is useful as tinder in starting fires Boy Scout style[269]. Some cultivars of this tree are suitable for ground cover when spaced about 90cm apart each way[208]. 'Tripartita' and 'Chamberlainii' have been recommended[208]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - very durable, light, brittle, soft, easily worked, very fragrant, insect-resistant[1, 46, 82, 171, 227]. The wood does not shrink much on drying and weighs 30lb per cubic foot[227]. The reddish wood is highly prized for cabinet making[226], it is also used for fencing, the casing of lead pencils etc[1, 46, 82, 171].

dwatta Abortifacient Anthelmintic Antiseptic Aromatherapy Cancer Diaphoretic Diuretic Emmenagogue Rubefacient StimulantPencil cedar leaves were much used medicinally by the native N. American Indians, and also in folk medicine by the white settlers, especially to treat chest complaints and skin problems such as venereal warts and other excrescences[269]. The leaves are anthelmintic, diuretic, rubefacient and stimulant[4, 257]. A decoction has been used in the treatment of coughs and colds, general weakness and as a medicine for convalescents[257]. The berries are anthelmintic, diaphoretic, emmenagogue and mildly antiseptic[4, 213, 222, 257]. They have been chewed as a treatment for mouth ulcers[213, 257] or made into a tea to treat colds, rheumatism, worms etc[222, 257]. The fresh young twigs are used as a diuretic[213]. An infusion has been used both internally and as a steam bath in the treatment of rheumatism[257]. The essential oil from the wood is an abortifacient, in some cases it has caused vomiting, convulsions, coma and death[4, 213]. The plant is said to contain the anticancer compound podophylotoxin[222]. The essential oil from the berries is used in aromatherapy. Its keyword is 'Composing'[210].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Christmas tree, Firewood, Screen, Seashore, Specimen, Street tree. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11] and succeeding on chalk[200]. Established plants are drought tolerant, succeeding in hot dry positions[200]. They are also fairly wind-resistant[200]. A very ornamental and hardy plant[1]. It is very slow growing[4] and apparently short-lived in Britain[185], though it is very long-lived in its native environment[226]. Another report says that plants live to a moderate age of 200 - 350 years in the wild[229]. Cultivated as a timber tree in some parts of C. and S. Europe[50] and used as a Christmas tree in parts of N. America[269], there are some named forms, selected

for their ornamental value[200]. Closely related to *J. scopulorum*, it hybridizes with that species where their ranges overlap[226]. The main difference between the two species is that the fruits of this plant mature in one year whilst those of *J. scopulorum* take two years[226]. This species often hybridizes with other members of the genus. The crushed foliage has an aroma like soap or paint[185]. Plants are resistant to honey fungus[88]. In America this tree is a host of a gall-like rust that at certain stages in its life-cycle also attacks the leaves of apple trees[149]. Plants are usually dioecious, though trees with both male and female flowers are occasionally found[229]. Male and female plants must usually be grown if seed is required. Special Features: Attracts birds, North American native, Fragrant foliage, Attracts butterflies, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

#### 4.2.147 *Ulmus rubra*

Slippery Elm  
3 tin 7 cyuc 2 kcaak 3 tcan 5 dwat 20 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlnjnyik hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta *Ulmus rubra* is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from March to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakka Edible Parts: Fruit Inner bark Leaves Edible Uses: TeaLeaves - raw or cooked. Inner bark - raw or cooked. It can be dried, ground into a powder and then used as a thickener in soups or added to cereal flours when making bread etc[2, 14, 46, 55, 171]. It can also be chewed as a thirst quencher[227]. The inner bark has been cooked with fats in order to prevent them becoming rancid[257]. Immature fruit - raw or cooked[177]. The fruit is about 20mm in diameter[200]. A tea-like beverage can be brewed from the inner bark[257].

tcanta Fibre Kindling Roofing Tinder WoodA fibre obtained from the inner bark is used to make a twine[189, 257]. The boiled bark has been used for making matting, nets etc[257]. The inner bark has been used in making baskets[257]. The bark has been used as a roofing material[257]. The weathered bark has been used as kindling for starting a fire[257]. Wood - very close-grained, tough, heavy, hard, strong, durable, easy to split. It weighs 43lb per cubic foot and is used for fence posts, window sills, agricultural implements etc[46, 61, 82, 227].

dwatta Demulcent Diuretic Emollient Expectorant Nutritive UrinarySlippery elm bark is a widely used herbal remedy and is considered to be one of the most valuable of remedies in herbal practice[4]. In particular, it is a gentle and effective remedy for irritated states of the mucous membranes of the chest, urinary tubules, stomach and intestines[254]. The inner bark contains large quantities of a sticky slime that can be dried to a powder or made into a liquid[229]. The inner bark is harvested in the spring from the main trunk and from larger branches, it is then dried and powdered for use as required[4]. Ten year old bark is said to be best[4]. Fine grades of the powder are best for internal use, coarse grades are better suited to poultices[238]. The plant is also part of a North American formula called *essiac* which is a popular treatment for cancer. Its effectiveness has never been reliably proven or disproven since controlled studies have not been carried out. The other herbs included in the formula are *Arctium lappa*, *Rumex acetosella* and *Rheum palmatum*[254]. The inner bark is demulcent, diuretic, emollient, expectorant, nutritive[4, 21, 165, 213]. It has a soothing and healing effect on all parts of the body that it comes into contact with[4] and is used in the treatment of sore throats, indigestion, digestive irritation, stomach ulcers etc[222]. It used to be frequently used as a food that was a nutritive tonic for

the old, young and convalescents[222]. It was also applied externally to fresh wounds, burns and scalds[222]. The bark has been used as an antioxidant to prevent fats going rancid[222]. The whole bark, including the outer bark, has been used as a mechanical irritant to abort foetuses[238]. Its use became so widespread that it is now banned in several countries[238].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200], it requires 2 - 3 months stratification according to another report[113]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Industrial Crop: Medicinal Management: Cop-pice Management: Standard Minor Global CropPrefers a fertile soil in full sun[188], but can be grown in any soil of at least moderate quality so long as it is well drained[1]. Plants are hardy to about -10°C[238]. A moderately fast-growing tree, living about 200 years in the wild[229], but although perfectly hardy, this species does not usually thrive in Britain[11]. Trees are often harvested in the wild for their edible inner bark, the 'slippery elm' that can be obtained from chemists and health food shops[K]. Trees have been over-exploited in the wild, plus they have also suffered from Dutch elm disease. As a result they are becoming much less common[238]. The slippery elm is very susceptible to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

#### 4.2.148 *Pinus strobus*

White Pine, Eastern white pine  
3 tin 7 cyuc 2 kcaak 0 tcan 3 dwat 20 m hkuc  
htut cyutli hgatyuctcup hwicli hyishrasjltut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta *Pinus strobus* is an evergreen Tree growing to 20 m (65ft) by 5 m (16ft) at a fast rate. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It cannot tolerate atmospheric pollution.

kcakka Edible Parts: Flowers Inner bark Seed Edible Uses: Condiment Drink Gum TeaSeed - raw or cooked[102, 159]. Rather small and fiddly, it is only about 6mm long[200]. The seed is mainly used as a flavouring in cooking[213]. The fresh needles are brewed into an aromatic tea that is rich in vitamins A and C[183]. A refreshing drink is made from the leaves[159]. An acceptable candy is made by boiling the tender new shoots in syrup[183]. The sticky amber sap can be used for chewing[102, 159]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200]. The firm unexpanded male cones can be boiled and used as a flavouring[177, 183]. A pleasant

propta Spores - best collected as soon as they are ripe in the spring and surface-sown immediately on a sterile compost. Keep moist and pot up as soon as the plants are large enough to handle. Very difficult[200]. Division. The plants usually spread very freely when well sited and should not really need any assistance.

nwatta Landscape Uses: Container, Ground cover, Wood-land garden. Prefers a moist soil with a pH between 6.5 and 7.5[200]. Plants are hardy to about -30°C[200]. The stems of this species were once exported to Britain in quantity from Holland so that they could be used as an abrasive for cleaning pots and pans[238]. Plants have a deep and penetrating root system and can be invasive. If grown in the garden they are best kept in bounds by planting them in a large container which can be sunk into the ground[200]. Special Features: North American native, Invasive, Naturalizing, Wetlands plant. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

#### 4.2.183 *Heliopsis helianthoides*

False sunflower, Oxeye sunflower  
3 tin 9 cyuc 2 kcaak 2 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli hgatyuctcup hwicli hrasjlnjnyikfrip hpa7tli flatprikwiw hpa7tmwatli hjonli

drutta *Heliopsis helianthoides* is a PERENNIAL growing to 1.5 m (5ft) by 1.2 m (4ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects, Birds. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakka Edible Parts: Flowers Edible Uses: The flowers have a mild taste and can be used as a garnish or in a salad [318-1].

tcanta Soil stabilizationPossibly used for erosion control due to the fibrous deep roots. Insectory: The nectar and pollen of the flowers attract their fair share of insects, including long-tongued bees, Halictine bees, bee flies, butterflies, *Chauliognathus pennsylvanicus* (Goldenrod Soldier Beetle), and other insects. Among the long-tongued bees, is the oligolege *Holcopasites heliopsis* (False Sunflower Bee). The caterpillars of *Papaipoma rigida* (Rigid Sunflower Borer Moth) sometimes bore through the stems[318-1]. Attracts birds and painted lady butterflies. Plant communities- Thickets Selected cultivars are shorter and attractive in a more formal garden. Smooth oxeye is considered one of the best hardy plants for a wildflower garden border [318-1].

dwatta Febriifuge MalariaOx-eye has been used in medicinal drinks, for treatment of lung troubles. The leaves have been used in a strong tea to reduce fevers and loosen phlegm. Stems have been used to treat malaria [318-1].

propta Seed, Cuttings, Division. *Heliopsis helianthoides* establishes readily from seed when planted in the winter/fall or early in spring (March to April). Germination generally starts four weeks after sowing if soil temperatures remain in the 60 - 70 degree Fahrenheit range. Seeds ripen approximately one month after flowering, however as with many Asters, plants are self sterile. It may be necessary to crack open a few seeds to make sure they are viable. Cuttings and Divisions: Five to seven node cuttings taken from the top 12 inches of growth in late spring root easily. Cuttings are sometimes reluctant to overwinter. Divide plants in the fall for best results [318-1].

nwatta An upright clumping perennial wildflower with sunflower-like heads. It performs well in dry (xeric) locations, in poor to average soils, and in full sun to partial shade. Flowering can be extended by removing spent flowers. Staking may be necessary in shady locations[318-1]. USDA Hardiness Zones: 3 - 9. Soil pH: 6.0 - 8.0. Growth Rate: Moderate. Life Span: Short-Lived Perennial. Stand Persistence: Long. Form: Upright. Texture: Coarse. Sun: Full Sun, Partial Shade. Soil Type: Loamy, Silty, Clay. Soil Moisture: Moderate, Dry. Minimum Root Depth: 12

inches. Root Type: Tap, Stolon. Fungal Types: Endomycorrhizal. Seasonal Interest: Summer. Fruit Type: Achene. Flower Color: Yellow. Drought: Tolerant. Flood: Moderate. Salt: Moderate. Soil Compaction: Moderate. Mowing: Tolerant. Fire Damage: Tolerant. Cold Injury: Infrequent. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer, Gophers, Mice, Rabbits. Growing Season: Warm. Bloom Time: Early Summer - Late Summer. Fruit Time: Summer - Fall [318-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Several cultivars are available with flowers of varying colors and shades. These include 'Summer Sun', 'Golden Plume', and 'Prairie Sunset'. The following cultivars of *H. helianthoides* var. *scabra* ("rough") have gained the Royal Horticultural Society's Award of Garden Merit: 'Benzinggold', 'Light of London', 'Spitzentänzerin', 'Waterperry Gold'.

#### 4.2.184 *Solidago canadensis scabra*

Canadian Goldenrod  
3 tin 7 cyuc 2 kcaak 0 tcan 2 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlnjnyikfrip hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta *Solidago canadensis scabra* is a PERENNIAL growing to 1.8 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakka Edible Parts: Leaves Seed Edible Uses: TeaYoung leaves and flowering stems - cooked[172]. Seed[22, 46, 61, 105, 161, 183]. It can be used as a thickener in soups[172]. The seed is very small and fiddly to harvest or utilize[K]. A tea can be made from the flowers and/or the leaves[172, 183].

tcanta Dye LatexA source of latex, contained in the leaves. A potentially good source of rubber[61]. Mustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta Antiseptic Haemostatic Salve Skin StypticThe whole plant is antiseptic, haemostatic, salve and styptic[168, 172, 257]. An infusion of the dried powdered herb can be used as an antiseptic[168]. A poultice of the flowers has been used in the treatment of ulcers and burns[257]. A poultice of the moistened, crushed root has been used in the treatment of boils[257].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. Hybridizes freely with *S. canadensis*[43]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238].

#### 4.2.185 *Galium aparine*

Goosegrass, Coachweed, Catchweed, Stickywillow  
3 tin 7 cyuc 2 kcaak 3 tcan 3 dwat 1.2 m hkuc  
pcimhmimhtut cyutli kyuctcup hwicli hrasjlnjnyik hpa7tli flatprikwiw hpa7tmwatli fyfxre7t hjonli



pcimhmim cyutli tcup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Polygonatum pubescens is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[102]. They can be used as an asparagus substitute. Root - cooked[102]. The root is up to 18mm thick[270]. It is rich in starch.

tcanta None known

dwatta Haemostatic OphthalmicA decoction of the plant has been used in the treatment of spitting up of blood[257]. An infusion of the roots has been used as an eye wash in the treatment of snow blindness[257].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture-retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but they tolerate most other conditions[200]. This species is closely related to *P. odoratum*[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs[K]. Hybridizes with other members of this genus[200].

## 4.2.181 Bupleurum falcatum

Thorow-Wax

3 tlin 7 cyuc 2 kcaok 0 tcan 2 dwat 1 m hkcuc hmimhtut cyutli kyucntcup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Bupleurum falcatum is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: RutinLeaves and young shoots - cooked[2, 105, 177]. The new growth in spring and autumn is used[178, 179]. It is a good source of rutin[179].

tcanta FuelThe old plant is used as a fuel[178, 179].

dwatta Alternative Analgesic Antibacterial Antiinflammatory Antiperiodic Antipyretic Antiviral Carminative Diaphoretic Emmenagogue Haemolytic Hepatic Malaria Pectoral Poulitice SedativeA paste of the plant is applied to boils[272]. The juice of the roots, mixed with the juice of *Centella asiatica*, is used in the treatment of liver diseases[272]. This species is closely related to *B. chinense* and quite possibly has the same uses. It is certainly worthy of some research. The uses of *B. chinense* are as follows:- Bei chai hu root has been used in traditional Chinese medicine for at least 2,000 years[238]. It is a bitter herb that is used to harmonize the body, balancing the different organs and energies within the body[254]. It strengthens the digestive tract, acts as a tonic for the liver and circulatory system, lowers fevers and has anti-viral effects[238]. The root is alterative,

analgesic, antibacterial, anti-inflammatory, antiperiodic, antipyretic, antiviral, carminative, diaphoretic, emmenagogue, haemolytic, hepatic, pectoral, sedative[116, 147, 174, 176, 178, 218, 238, 254]. It is taken internally in the treatment of malaria, blackwater fever, uterine and rectal prolapse, haemorrhoids, sluggish liver, menstrual disorders, abdominal bloating etc[238]. The roots are harvested in the autumn and can be used fresh or dried[238]. The root contains saikosides[254]. These saponin-like substances have been shown to protect the liver from toxicity whilst also strengthening its function, even in people with immune system disorders[254]. These saikosides also stimulate the body's production of corticosteroids and increase their anti-inflammatory affect[254]. The plant is often used in preparations with other herbs to treat the side effects of steroids[218].

propta Seed - sow spring in a cold frame. The seed usually germinates in 2 - 8 weeks at 15°C[138]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer or following spring. Division in spring. Very easy, larger clumps can be planted direct into their permanent positions. It is best to pot up smaller clumps and grow them on in a cold frame until they are well rooted before planting them out in the summer.

nwatta An easily cultivated plant[1], it succeeds in a sunny position in most fertile well-drained soils[138, 233, 238].

## 4.2.182 Equisetum hyemale

Dutch Rush, Scouringrush horsetail, Horsetail, Scouring Rush, Rough Horsetail

3 tlin 11 cyuc 2 kcaok 3 tcan 2 dwat 1 m hkcuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Equisetum hyemale is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root StemEdible Uses: Strobil (the fertile shoots in spring) - cooked[177]. An asparagus substitute. Caution is advised, see the notes above on toxicity. Roots - dried and then cooked[257]. A source of starch[177]. Caution is advised, see the notes above on toxicity. A further report says that the peeled stems, base of the plant, root and tubers were eaten raw by the N. American Indians, the report went on to say that this may be inadvisable[85].

tcanta Dye Fungicide Liquid feed Musical Paper Parasiticide Polish Sandpaper ScourerThe stems are very rich in silica[4]. They are used for scouring and polishing metal[1, 4, 46, 61, 99] and as a fine sandpaper[54, 99]. The stems are first bleached by repeated wetting and drying in the sun[74]. They can also be used as a polish for wooden floors and furniture[46, 178]. The infused stem is an effective fungicide against mildew, mint rust and blackspot on roses[14]. It also makes a good liquid feed[54]. Used as a hair rinse it can eliminate fleas, lice and mites[213, 257]. A light pink dye is obtained from the stem[99]. The hollow stems have been used as whistles[257]. Another report says that the stem joints are pulled apart and used by children to produce a whistling sound[257].

dwatta Antibacterial Antiinflammatory Antispasmodic Appetizer Cancer Diaphoretic Diuretic Expectorant Febrifuge Hypotensive Parasiticide StypticHorsetails have an unusual chemistry compared to most other plants[238]. They are rich in silica, contain several alkaloids (including nicotine) and various minerals[238, 279]. The plant is anticancer, anti-inflammatory, antispasmodic, diaphoretic, diuretic, expectorant, febrifuge, haemostatic, hypotensive and styptic[147, 176, 218, 279]. It also has an appetite-stimulating effect[279]. The barren stems are used, they are most active when fresh but can also be dried and sometimes the ashes of the plant are used[4]. The plant is a useful diuretic when taken internally and is used in the treatment of kidney and bladder problems[4]. A decoction applied externally will stop the bleeding of wounds and promote healing[4]. The plant contains polyphenolic flavonoids with bactericidal activity[218].

sweet flavour[257]. Inner bark - raw or cooked. A sweet flavour[105, 159, 161, 213]. There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread.

tcanta Dye Gum Herbicide Miscellany Pitch Waterproofing WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing canoes, containers etc, as a wood preservative etc[257]. Wood - straight and close-grained, light, soft, not strong, works easily and takes an excellent natural or painted finish[46, 61, 82, 171, 226, 229]. It weighs 24lb per cubic foot[235]. A very valuable timber[235], the wood is especially suited for making the masts of ships[4] and is also used for lumber, cheap furniture, house interiors, construction etc[46, 61, 82, 171, 226, 229].

dwatta Antiscorbutic Demulcent Diuretic Expectorant Miscellany Pectoral Poulitice Salve Vitamin CWhite pine was employed medicinally by several native North American Indian tribes who valued it especially for its antiseptic and vulnerary qualities, using it extensively in the treatment of skin complaints, wounds, burns, boils etc[257]. It is also very beneficial to the respiratory system and so was used in treating coughs, colds, influenza and so on[257]. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. A poultice of pitch has been used to draw out toxins from boils and reduce the pain[257]. The dried inner bark is demulcent, diuretic and expectorant[4]. An infusion was used as a treatment for colds[213] and it is still used as an ingredient in commercial cough syrups, where it serves to promote the expulsion of phlegm[213]. A poultice made from the pounded inner bark is used to treat cuts, sores and wounds[213]. The wetted inner bark can be used as a poultice on the chest in treating strong colds[257]. The dried inner bark contains 10% tannin, some mucilage, an oleoresin, a glycoside and a volatile oil[213]. A tea made from the young needles is used to treat sore throats[213]. It is a good source of vitamin C and so is effective against scurvy[213]. An infusion of the young twigs has been used in the treatment of kidney disorders and pulmonary complaints[257]. The powdered wood has been used as a dressing on babies chaffed skin, sores and improperly healed navels[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This

method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Christmas tree, Aggressive surface roots possible, Screen, Superior hedge, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Intolerant of atmospheric pollution[188]. The white pine is a very important timber crop in its native range, the huge stands that existed before the Europeans went to N. America have been largely cut down[229]. It is a fast-growing and fairly long-lived tree[229] that is often cultivated as a timber tree, especially in central Europe[50]. Young trees grow very vigorously with new shoots of up to 1 metre common. Growth slows and almost ceases by the time the tree is 20 metres tall[185]. Trees can produce cones when 5 - 10 years old, but reliable seed production takes another 10 years[229]. Good crops are produced every 3 - 5 years in the wild, with little seed in the intervening years[229]. The cones are 10 - 20cm long and take 2 years to mature[82, 229], they open and shed their seed in late summer whilst still attached to the tree[82, 226]. Plants often self-sow in Britain[185]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Trees have a very thin bark, which makes them particularly susceptible to forest fires[226]. This species is very susceptible to white pine blister rust, it should not be grown near any gooseberries or currants (*Ribes* species) since these plants can act as vectors for the disease[1, 120]. Plants are also subject to aphid damage[1]. Plants in this genus are notably susceptible to honey fungus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Special Features: Attracts birds, Attractive foliage, North American native, Fragrant foliage, Naturalizing, Inconspicuous flowers or blooms.

## 4.2.149 Picea engelmannii

Mountain Spruce, Engelmann spruce

3 tlin 7 cyuc 2 kcaok 0 tcan 2 dwat 20 m hkcuc htut cyutli tcuphja7n hwicli hyishrasjlutnyk hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Picea engelmannii is an evergreen Tree growing to 20 m (65ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are about 5cm long[82]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food when all else fails. Seed - raw[172]. The seed is about 2 - 4mm long[229] and is too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta Basketry Charcoal Fibre Fuel Tannin WoodThe bark is a source of tannin[46, 61, 82]. The branches and the roots have been shredded, pounded and used to make cord and rope[257]. (It is probably the bark that was used[K].) The bark has been used to make baskets and various small utensils[257]. Wood - close-grained, light, soft, not strong. It is used for lumber, construction, fuel and charcoal[46, 61, 82, 171]. It is also valued for its use in the pulp industry to make paper[171].

dwatta Cancer Eczema Pectoral Salve Skin TB Vitamin CAn infusion of the bark has been used in the treatment of respiratory complaints, TB etc[257]. A decoction of the

leaves and gum has been used in the treatment of cancer[257]. It was said that if this treatment did not work then nothing would work[257]. The decoction was also used in the treatment of coughs[257]. The ashes of the twigs, mixed with oil, have been used as an ointment or salve on damaged skin[257]. The pitch obtained from the trunk has been used in the treatment of eczema[257].

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. Plants have a shallow root system and are easily wind-blown[155]. Often planted for its timber in N. Europe[50]. Trees are of moderate growth after a slow start, older trees often averaging over 40cm a year[185]. Trees grow better and faster in the north of Britain than in the south. This is not an easy tree to grow in Britain[1], it prefers a continental climate and, although the dormant tree is very cold hardy, the new growth in spring is very susceptible to damage by late frosts in this country[11]. Quite long-lived in its native range, with specimens 500 - 600 years old[229]. Seed production commences around the age of 20 - 25 years, with excellent crops every 2 - 6 years[229]. Closely related to *P. glauca*, this species also hybridizes with *P. sitchensis* in the south of its range[226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. The crushed foliage is often said to be foetid but after the first sniff the scent is sweet and like menthol or camphor[185]. Plants are susceptible to damage by the green spruce aphid[11].

### 4.2.150 *Betula platyphylla*

White Birch, Asian white birch, 3 tin 6 cyuc 2 kcaak 2 tcan 2 dwat 20 m hkuc htut cyutli kyuctcup hwicli hyishrasjltunykifrip hpa7tli flat-prikkwis hpa7tmwatli hjonli

drutta *Betula platyphylla* is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Inner bark SapEdible Uses: Inner bark - cooked. Rich in starch[177]. It can be dried and ground into a meal and used as a thickener in soups etc or mixed with flour for making bread, biscuits etc. Inner bark is generally only seen as a famine food, used when other

forms of starch are not available or are in short supply[K]. Sap. Used for making a vinegar[177].

tcanta Dynamic accumulator.

dwatta Antifungal Antiinflammatory Antiseborrheic Cancer Tonic UrinaryThe bark of the sub-species *Betula platyphylla japonica* is often used medicinally in Korea. It contains several medically active constituents including triterpenoids and flavonoids and is antifungal, anti-inflammatory and tonic[279]. It is used in the treatment of conditions such as internal diseases and inflammation[279]. The root bark, and other parts of the plant, show anticancer activity[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Landscape Uses:Specimen. Succeeds in a well-drained loamy soil in a sunny position[11, 200]. Tolerates most soils including poor soils and heavy clays[200]. Fairly wind tolerant[200]. A fast-growing but short-lived tree[200]. Hybridizes freely with other members of this genus[50]. This species is closely related to *B. pendula*[11]. A good plant to grow near the compost heap, aiding the fermentation process[20]. Trees are notably susceptible to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 4.2.151 *Thuja occidentalis*

American Arborvitae, Arbrorvitae, Eastern Arborvitae, Siberian Arbrorvitae, Northern White Cedar, Wh 3 tin 7 cyuc 2 kcaak 0 tcan 3 dwat 15 m hkuc hmimhtut cyutli tucpja7n hwicli hrasjlutnykifrip hpa7tli flat-prikkwisslip hpa7tmwatli hjonli

drutta *Thuja occidentalis* is an evergreen Tree growing to 15 m (49ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: StemEdible Uses: TeaPith of young shoots - cooked[105]. It can be added to soups[177]. Pleasantly sweet, the pith was used as the basis of the soup according to one report[183]. Inner bark - cooked. It is only used in times of emergency or scarcity[213]. The inner bark can be dried and ground into a powder, then used with wheat or other cereals in making bread, biscuits etc. The leafy branchlets are used as a tea substitute[159, 177, 257] but are probably best avoided by pregnant women[165]. An aromatic flavour[183]. Another report says that the foliage and bark are used, the resulting tea is a good source of vitamin C[226].

tcanta Broom Essential Fibre Incense Repellent Tannin WoodTolerant of regular trimming, though not into the old wood, it can be grown as a hedge[226]. The fresh branches are used as besoms[4]. Their aromatic smell serves to deodorize the house whilst sweeping[226]. The leaves have been kept in the clothes cupboard as a perfume, incense and insect repellent[257]. The leaves and stems have been used as an incense[257]. An essential oil is obtained from

grow them on in a cold frame for their first winter and then plant them out in the spring. Division in spring or autumn. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Landscape Uses:Border. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position and a moist soil[1, 14, 200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Tolerates a pH in the range 4.8 to 8.2. Established plants are drought tolerant[200]. Mugwort is an aggressive and invasive plant[14], it inhibits the growth of nearby plants by means of root secretions[20, 201]. The sub-species *A. vulgaris parviflora*. Maxim. is the form that is eaten in China[179]. There are some named varieties[200]. 'White' is a taller plant than the type species, growing to 1.5 metres. It has a strong, rather resinous or "floral" taste similar to chrysanthemum leaves and is used in soups or fried as a side dish[183]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Edible, Not North American native, Invasive, Attracts butterflies, Suitable for dried flowers, Fragrant flowers, Inconspicuous flowers or blooms.

### 4.2.178 *Oenothera glazioviana*

Large-Flower Evening Primrose, Redsepal evening primrose 3 tin 7 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli fyfxfre7t hjonli

drutta *Oenothera glazioviana* is a BIENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves Oil RootEdible Uses: Oil-Root - cooked. Boiled and eaten like salsify[144]. Fleshy and succulent. Young shoots - raw or cooked[144]. Mild and inoffensive[144]. Seed contains 28% of a drying oil[114]. It is edible and a very good source of gammalinolenic acid[141], an essential fatty acid that is not found in many plant sources and has numerous vital functions in the body. Difficult to harvest, it has to be done by hand[160].

tcanta Miscellany OilNone known

dwatta Anticholesterolemic Astringent Hypotensive Miscellany SedativeThe oil in the seeds is anticholesterolemic, astringent, hypotensive, sedative[4, 21]. Reduces cholesterol levels[66]. Research suggests that the oil is potentially very valuable in the treatment of multiple sclerosis, pre-menstrual tension, hyperactivity etc[66].

propta Seed - sow in situ from late spring to early summer.

nwatta Prefers a dryish well-drained sandy loam and full sun[1, 200]. Heavy clay soils may induce winter rots[200]. Succeeds on poor soils[200]. The flowers open in the evening, they are richly scented and are very attractive to moths[4]. The seeds are a good food source for birds, especially finches[200]. The plants of this species are of hybrid origin and usually mutate freely[1]. Usually self-sows freely if in a suitable position[K].

### 4.2.179 *Rosa virginiana*

Virginia Rose 3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnykifrip hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

drutta *Rosa virginiana* is a deciduous Shrub growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium

(loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[177]. The fruit is up to 15mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The buds are eaten by native Indians in N. America[161, 177, 183]. No further details are given, does this refer to the leaf or flower buds? The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102].

tcanta Hedge Hedge Soil stabilizationCan be grown as a hedge, succeeding in windy positions[1, 11]. The suckering form of this species can be used to fix sand dunes[11]. It also makes a good ground cover[245].

dwatta Anthelmintic Cancer Haemostatic OphthalmicA decoction of the roots has been used as a bath and to treat worms in children[257]. An infusion of the roots has been drunk and used as a wash in treating bleeding cuts on the feet[257]. An infusion of the roots has been used as a wash to treat sore eyes[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeeds in most soils, preferring one on the dryish side[11]. Grows well in heavy clay soils. Prefers a circumneutral soil and a sunny position[200]. Dislikes water-logged soils. Does well in a windy position[11]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. The flowers are fragrant[245]. The form in cultivation in Britain is very invasive, forming thickets with its suckers, whilst the wild form does not produce suckers[11]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

### 4.2.180 *Polygonatum pubescens*

Hairy Solomon's Seal 3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc

declared a noxious weed in some countries. Since being introduced in N. America it has invaded native marshlands, forming large areas of dense stands and crowding out many native species[274]. A very ornamental plant[1]. A good bee and butterfly plant[24]. Plants usually self-sow when well sited[200]. Special Features:Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 4.2.176 Aquilegia vulgaris

Columbine, European columbine, Granny's Bonnet, European Crowfoot  
3 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyuti tcup hwicli hrasljut hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Aquilegia vulgaris is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FlowersEdible Uses: TeaFlowers - raw. Rich in nectar, they are sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K]. The flowers are also used as a tea substitute[177].

tcanta Parasiticide ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172]. The dried and crushed seed is used to kill external body parasites[53].

dwatta Antianxiety Astringent Depurative Diaphoretic Diuretic Homeopathy Parasiticide ParasiticideColumbine was formerly employed in herbal medicine mainly for its antiscorbutic effect, but it has fallen out of favour and is little used nowadays[268]. The leaves root and seed are astringent, depurative, diaphoretic, diuretic, parasiticide[4, 7, 9, 19, 21]. Because of its toxic properties, this plant should not be taken internally without expert advice, though the root is sometimes used externally in poultices to treat ulcers and the commoner skin diseases[7, 268]. The plant can be harvested at any time from June to October[7]. Columbine has produced very unsatisfactory results and is not normally used medicinally[4]. A homeopathic remedy is made from the plant[7]. It is used in the treatment of affections of the nervous system[7].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwwata Landscape Uses:Border, Rock garden, Woodland garden. Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Thrives in partial shade[1, 111]. Intolerant of heavy clay[200]. Plants are hardy to at least -25°C[187]. Whilst the blue-flowered forms of this species have no scent, white flowered forms have a soft clove scent in order to attract pollinating insects[245]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. This species usually self-sows freely in the garden, it is very apt to hybridize with other members of the genus and usually becomes the dominant partner in any hybridization[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54, 201]. It also attracts red spider mites to the garden, these can then move on to other crops such as apples, pears and strawberries[201]. It grows well with rhubarb[201]. Special Features:Attracts birds, Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for

their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

### 4.2.177 Artemisia vulgaris

Mugwort, Common wormwood, Felon Herb, Chrysanthemum Weed, Wild Wormwood  
3 tin 9 cyuc 2 kcaak 1 tcan 3 dwat 1.2 m hkuc  
hmimhtut cyuti hqatkyucup hwicli hrasljutnyk hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Artemisia vulgaris is a PERENNIAL growing to 1.2 m (4ft) by 0.7 m (2ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

ckakta Edible Parts: LeavesEdible Uses: Colouring CondimentLeaves - raw or cooked[2, 9, 12, 27, 177]. Aromatic and somewhat bitter[244]. Their addition to the diet aids the digestion and so they are often used in small quantities as a flavouring, especially with fatty foods[183, 244]. They are also used to give colour and flavour to glutinous-rice dumplings (Mochi)[183, 244]. The young shoots are used in spring[46]. In Japan the young leaves are used as a potherb[183]. The dried leaves and flowering tops are steeped into tea[183]. They have also been used as a flavouring in beer, though fell into virtual disuse once hops came into favour[4].

tcanta Insecticide Repellent TinderThe fresh or the dried plant repels insects, it can be used as a spray but caution is advised since it can also inhibit plant growth[20]. A weak tea made from the infused plant is a good all-purpose insecticide[201]. An essential oil from the plant kills insect larvae[218]. The down on the leaves makes a good tinder for starting fires[115]. A number of species of Lepidoptera (butterflies and moths) feed on the leaves and flowers.

dwatta Anticonvulsant Antidepressant Antiemetic Antiseptic Antispasmodic Appetizer Carminative Cholagogue Diaphoretic Digestive Diuretic Emmenagogue Expectorant Foot care Haemostatic Nervine Purgative Stimulant Tonic Women's complaintsMugwort has a long history of use in herbal medicine especially in matters connected to the digestive system, menstrual complaints and the treatment of worms[238]. It is slightly toxic, however, and should never be used by pregnant women, especially in their first trimester, since it can cause a miscarriage[7, 238]. Large, prolonged dosage can damage the nervous system[268]. All parts of the plant are anthelmintic, antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, digestive, emmenagogue, expectorant, nervine, purgative, stimulant, slightly tonic and used in the treatment of women's complaints[4, 7, 13, 21, 147, 165, 178, 201]. The leaves are also said to be appetizer, diuretic, haemostatic and stomachic[176, 218, 222]. They can be used internally or externally[218]. An infusion of the leaves and flowering tops is used in the treatment of nervous and spasmodic affections, sterility, functional bleeding of the uterus, dysmenorrhoea, asthma and diseases of the brain[176, 243]. The leaves have an antibacterial action, inhibiting the growth of *Staphylococcus aureus*, *Bacillus typhi*, *B. dysenteriae*, streptococci, *E. coli*, *B. subtilis*, *Pseudomonas* etc[176]. The leaves are harvested in August and can be dried for later use[4]. The stem is also said to be antirheumatic, antispasmodic, and stomachic[218]. The roots are tonic and antispasmodic[243]. They are said to be one of the best stomachics[4]. They are harvested in the autumn and dried for later use[4]. The leaves, placed inside the shoes, are said to be soothing for sore feet[238]. The compressed dried leaves and stems are used in moxibustion[176, 178, 218, 222, 238]. Another report says that the down from the leaves is used[4].

propta Seed - surface sow from late winter to early summer in a greenhouse and do not allow the compost to dry out. When large enough to handle, prick out the seedlings into individual pots. If growth is sufficient, they can be planted out into their permanent positions in the summer, otherwise

the leaves and branches, it is used in perfumery and in medicines[46, 57, 61, 226]. It is poisonous if taken internally[65]. This essential oil also has insect repellent properties[106]. The tough and stringy bark has been used to weave fibre bags[257]. The bark is a source of tannin[257]. Wood - light, soft, not strong, brittle, coarse grained, very durable, easily worked, does not warp[61, 82, 171, 226, 235]. It weighs 20lb per cubic foot[235]. Used especially where contact with water cannot be avoided, for canoes, garden buildings, shingles, posts etc[11, 61, 82, 171, 226].

dwatta Alterative Anthelmintic Antiinflammatory Antirheumatic Antiseptic Antiviral Aromatic Astringent Diaphoretic Diuretic Emmenagogue Homeopathy Rubefacient Vitamin CArmenian arbor-vitae was much used by many native North American Indian tribes as a medicine to treat fevers, coughs, headaches, swollen hands and rheumatic problems[254, 257]. The plant has an established antiviral activity and is most commonly used in modern herbalism to treat warts and polyps, being prescribed both internally and externally for these conditions[254]. The plant can be used to induce menstruation and so should not be prescribed for pregnant women[238]. The recently dried leafy young twigs are alterative, antihelmintic, anti-inflammatory, antiseptic, aromatic, astringent, diaphoretic, diuretic and emmenagogue[4, 7, 21, 165]. The plant is being used internally in the treatment of cancer[238], especially cancer of the uterus[254]. A tea made from the leaves is used in the treatment for bronchitis and other respiratory problems, colds, headaches and as a cough syrup[222, 254]. The plants diuretic properties make it useful in treating acute cystitis and bed-wetting in children[254]. The leaves are used in steam baths in the treatment of rheumatism, arthritis, colds etc[222]. Externally, the leaves are used as a wash for swollen feet and burns[222]. Extracts of the leaves can be painted on painful joints or muscles as a counterirritant, improving local blood supply and thus facilitating the removal of toxins, easing pain and stiffness[254]. A tincture of the leaves has been used in the treatment of warts, piles, bed sores and fungal infections[222]. The leaves and young twigs can be harvested as required and used fresh or dried[238]. 'Oil of white cedar', obtained from the leaves, is an essential oil that is antiseptic, expectorant and rubefacient[213, 222]. It is used internally to promote menstruation and relieve rheumatism[213]. This volatile oil is toxic and poisoning from overdoses has occurred[213], it should only be used under the supervision of a qualified practitioner and should not be prescribed for pregnant women[238]. The oil also stimulates the heart and causes convulsions in high doses[213]. A tea of the inner bark is used to promote menstruation[213] and in the treatment of consumption and coughs[222]. A homeopathic remedy is made from the leaves and twigs, gathered when the tree is flowering[232]. It is used in the household as a treatment against warts, but also has a range of other applications that should only be prescribed by a competent homeopath[7, 232].

propta Seed - best sown when ripe in the autumn in a cold frame[113]. Stored seed germinates best if given a short cold stratification[113]. It can be sown in a cold frame in late winter. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If growing large quantities of plants, the seed can be sown in an outdoor seed bed in mid spring[78]. Grow the plants on for two years and then plant them out into their permanent positions in late autumn or early spring. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a shaded frame. Forms roots by the end of September but it should be overwintered in a frame[78]. Cuttings of almost ripe wood, 5 - 10cm with a heel, September in a cold frame. Forms roots in the following summer. Plant out in autumn or spring[78].

nwwata Landscape Uses:Firewood, Hedge, Screen, Superior hedge, Specimen. Prefers a permanently moist soil[1], it is intolerant of dry soils[11]. A useful plant for very poorly drained soils[185, 200]. The best stands in America are on well-drained soils[11]. Grows well in heavy clay soils. Succeeds in sandy soils[188] and on chalk[200]. A very hardy tree, tolerating very cold winters with temperatures down to -46°C[200, 238]. In cold weather the leaves turn brown, becoming green again in the spring[226]. It is usually slow growing and short-lived in cultivation in Britain and rarely

looks thrifty[81, 185]. However, there are some good specimens in western Britain[4, 14]. Some cultivars are more healthy, 'Lutea' is growing very well in several places and 'Spiralis' is also growing well[185]. Trees live 200 - 300 years in the wild[226]. Sometimes planted as a timber tree in C. Europe[50]. Plants cannot regenerate from old wood. Pruning is not normally necessary for this species, any pruning that is carried out should be done with care[238]. The wood and the foliage are strongly aromatic[226]. The crushed leaves have a scent of apples[185]. Special Features: Attracts birds, North American native, Wetlands plant, Inconspicuous flowers or blooms.

### 4.2.152 Hemiptelea davidii

3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 15 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyk hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Hemiptelea davidii is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves OilEdible Uses: Oil TeaYoung leaves - cooked. Mixed with rice dumplings[177]. The tender leaves make a good beverage[266].

tcanta Fibre Hedge Hedge Oil WoodPlants are grown as a hedge in China[109]. The fibre from the bark is used for manufacturing staple rayon and sacks[266]. An oil is extracted from the seeds[266]. The report does not say if the oil is edible, nor does it give any uses. Wood - hard. It is used for making utensils[266].

dwatta Demulcent Diuretic Febrifuge LenitiveDemulcent, diuretic, febrifuge, lenitive[178].

propta Seed - best harvested as soon as it is ripe but before it has fully dried on the plant and sown immediately in a cold frame. Stored seed requires stratification and should be sown as soon as possible[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Seed can be stored cold and dry[200].

nwwata Prefers a deep moist loamy soil, succeeding in acid and alkaline conditions[200]. Relatively shade tolerant[200]. Plants are probably resistant to Dutch Elm disease[200]. Plants can be hermaphrodite or monoecious.

### 4.2.153 Sorbus aucuparia

Mountain Ash, European mountain ash  
3 tin 6 cyuc 2 kcaak 3 tcan 2 dwat 15 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyk hpa7tli frusflatprikwiw hpa7tmwatli xre7t hjonli

drutta Sorbus aucuparia is a deciduous Tree growing to 15 m (49ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

ckakta Edible Parts: Fruit Leaves OilEdible Uses: Coffee Oil TeaFruit - raw or cooked[2, 3, 5, 7, 9]. The fruit is very acid and large quantities of the raw fruit can cause stomach upsets[10, 13]. It can be used to make delicious, if slightly acidulous, jams and preserves[7], the fruit can also be dried and used as a flour mixed with cereals[2, 66]. The fruit is about 7.5mm in diameter[200] and is produced in

quite large bunches making harvest easy[K]. The leaves and flowers are used as a tea substitute[61, 183]. Young leaves are said to be a famine food but they contain a cyanogenic glycoside so you should be very hungry before even thinking of eating them[179]. A coffee substitute[183]. The report was referring to the fruit, it probably means the roasted seed.

tcanta Cosmetic Dye Oil Shelterbelt Tannin WoodAn oil is obtained from the seed[13]. A cosmetic face-mask is made from the fruits and is used to combat wrinkled skin[7]. A black dye is obtained from the young branches[74]. All parts of the plant contain tannin and can be used as a black dye[4]. Trees are very wind resistant and can be used in shelterbelt plantings[11, 200]. Wood - hard, fine grained, compact and elastic. It is highly recommended by wood turners and is also used to make hoops for barrels, cogs and furniture[7, 13, 61, 74, 113].

dwatta Antirheumatic Antiscorbutic Aperient Astringent Diuretic Hypoglycaemic Laxative Vitamin CThe bark is astringent, it is used in the treatment of diarrhoea and as a vaginal injection for leucorrhoea etc[4]. The fruit is antiscorbutic and astringent[4, 7]. It is normally used as a jam or an infusion to treat diarrhoea and haemorrhoids[254]. An infusion can also be used as a gargle for sore throats and as a wash to treat haemorrhoids and excessive vaginal discharge[254]. The seeds contain cyanogenic glycosides which, in reaction with water, produce the extremely toxic prussic acid[254]. In small quantities this acts as a stimulant to the respiratory system but in larger doses can cause respiratory failure and death[K]. It is therefore best to remove the seeds when using the fruit medicinally or as a food[254]. Both the flowers and the fruit are aperient, mildly diuretic, laxative and emmenagogue[9, 13, 21]. An infusion is used in the treatment of painful menstruation, constipation and kidney disorders[9].

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Landscape Uses:Specimen. Succeeds in most reasonably good soils in an open sunny position[11]. Grows well in heavy clay soils. Tolerates some shade[186], though it fruits better in a sunny position[K]. Prefers a cool moist position and a lighter neutral to slightly acid soil[11, 13, 200]. Dislikes shallow soils or drought[11, 200]. Succeeds on chalk or acid peats[98, 186]. A very wind firm tree tolerating very exposed and maritime positions[186, 200]. Tolerates atmospheric pollution[200]. Some named varieties have been developed for their improved fruits which are larger and sweeter than the type[183]. Plants, and especially young seedlings, are quite fast growing[186]. The fruit is very attractive to birds. 28 species of insects are associated with this tree[186]. Responds well to coppicing[186]. Plants are susceptible to fireblight[188]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available.

The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 4.2.154 *Betula populifolia*

Grey Birch

3 tlin 6 cyuc 2 kcaak 3 tcan 1 dwat 12 m hkuc  
htut cyutli kyucitcup hwicli hyhshrasljutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta *Betula populifolia* is a deciduous Tree growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in April, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant is not wind tolerant.

kcakta Edible Parts: Inner bark SapEdible Uses: Inner bark - cooked or dried and ground into a meal. The meal can be used as a thickener in soups etc, or be added to flour when making bread, biscuits etc. Inner bark is generally only seen as a famine food, used when other forms of starch are not available or are in short supply[177, K]. Sap - sweet. Harvested in early spring, before the leaves unfurl, by tapping the trunk. The flow is best on warm days that follow frosty nights. The sap is drunk as a sweet beverage or it can be fermented to make birch beer or vinegar[177, 183]. An old English recipe for the beer is as follows: "To every Gallon of Birch-water put a quart of Honey, well stirr'd together; then boil it almost an hour with a few Cloves, and a little Limon-peel, keeping it well scummd. When it is sufficiently boil'd, and become cold, add to it three or four Spoonfuls of good Ale to make it work...and when the Test begins to settle, bottle it . . . it is gentle, and very harmless in operation within the body, and exceedingly sharpens the Appetite, being drunk ante pastum."[269].

tcanta Charcoal Pioneer WoodA pioneer species, readily invading old fields, burnt-over or cleared land and providing suitable conditions for other woodland trees to become established[226]. It is an excellent crop for very poor soils, where it grows rapidly and affords protection to the seedlings of more valuable and slower-growing trees[82]. Since this species is short-lived and not very shade tolerant, it is eventually out-competed by these other trees[226]. Wood - close-grained, soft, light, weak, not durable[61, 82, 229, 235]. It weighs 36lb per cubic foot[235]. Unimportant commercially, the wood is used locally for making clothes pegs, spools, pulp, charcoal and quite commonly as a fuel[61, 82, 229].

dwatta Antiseborrheic Astringent UrinaryThe bark is astringent. a decoction has been used to treat bleeding piles[257]. Scrapings of the inner bark have been used to treat swellings in infected cuts[257]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Betula* species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Landscape Uses:Firewood, Specimen. Succeeds in a well-drained loamy soil in a sunny position[11, 200]. Tolerates most soils doing well on poor ones[1] and on heavy clays. A fast growing tree, though it rarely lives longer than 50 years[200, 229]. It is a pioneer species of abandoned fields, burnt-over lands, cleared woodlands etc[200, 229]. A fairly wind-tolerant plant[200], but it is shallow-rooted and older trees are often uprooted by winds and heavy snow in the wild[229]. Hybridizes freely with other members of this genus[50], especially with *B. papyrifera*[43]. A good

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Shade tolerant[15], but plants prefer a sunny position[37]. Grows well in heavy clay soils. Hardy to at least -20°C[200]. This species is probably a parent of the cultivated rhubarb, *R. x cultorum*[200]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 4.2.174 *Polygonatum biflorum*

Small Solomon's Seal

3 tlin 7 cyuc 2 kcaak 2 tcan 1 dwat 1 m hkuc  
pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Polygonatum biflorum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - raw or cooked[159, 177]. An excellent vegetable when boiled and used as an asparagus substitute[183]. Root - cooked[61]. The flavour is somewhat bitter, to counteract this the root is sliced crosswise, cooked in alkaline water and the water changed during the cooking process[183]. When steamed and sun-dried nine times the root is delicious[179]. The roots are rich in starch, this can be extracted by beating or grinding the dried root, the starch can then be used to make bread or can be mixed in other foods such as soups[159, 183, 257].

tcanta IncenseThe root has been burnt as an incense[257]. It is said that when the root is burnt in the bedroom just before going to sleep, the person would sleep soundly and awaken refreshed, rested and feeling young[257].

dwatta Laxative Poulitce SedativeA tea made from the roots is laxative[222]. It has been used in the treatment of indigestion, profuse menstruation, lung ailments, general debility etc[222]. It is a folk remedy for piles, rheumatism and skin irritations[222]. A poultice or a decoction of the fresh roots is applied to cuts, bruises, sores etc[222, 257].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture-retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but they tolerate most other conditions[200]. A very ornamental plant, it grows well in woodland and copses[1, 42]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots are very attractive to slugs[K]. Hybridizes with other members of this genus[200]. *Polygonatum biflorum* var. *commutatum* (Schult. and Schult.f.) Morong is a synonym of *Polygonatum biflorum* (Walter) ElliottThe plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture

design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.175 *Lythrum salicaria*

Purple Loosestrife

3 tlin 10 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc  
hmimhtut cyutli tcuphja7hns6 hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lythrum salicaria* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves RootEdible Uses: ColouringLeaves - cooked[13, 46, 61, 105]. Rich in calcium[179]. Root - cooked[13]. An edible dye is obtained from the flowers[13].

tcanta Cosmetic Dye Preservative Tannin TeethA decoction of the plant is impregnated into wood, rope etc to prevent it rotting in water[74]. The leaves contain about 12% tannin, the stems 10.5%, the flowers 13.7% and the roots 8.5%[218]. It is probably these tannins that preserve the wood etc[218]. The powdered plant is used cosmetically in face-packs to counteract reddened skin[7].

dwatta Antibiotic Antidiarrhoeal Astringent Dysentery Eczema Hypoglycaemic Styptic VeneraryPurple loosestrife is an astringent herb that is mainly employed as a treatment for diarrhoea and dysentery. It can be safely taken by people of all ages and has been used to help arrest diarrhoea in breast-feeding babies[254]. It can also be used to treat heavy periods and inter-menstrual bleeding[254]. Modern research has shown the whole plant to be antibiotic and to be particularly effective against the micro-organism that causes typhus[254]. The flowering plant is antibiotic, highly astringent, hypoglycaemic, styptic and vulnerary[4, 7, 9, 21, 152, 218, 238]. It is valued as an intestinal disinfectant, especially in cases of enteritis[7], an infusion is used internally in the treatment of diarrhoea, internal bleeding, excessive menstruation etc[9, 222, 238]. The flowering plant is harvested in the summer and can be used fresh or dried[9]. Externally, the plant is used as a cleansing and healing wash for wounds, sores, impetigo, eczema, excess vaginal discharge, vaginal itching etc[7, 222, 238, 254]. The powdered plant is used as a haemostatic in cases of severe nosebleeds[7]. The stems are regarded as gum stimulators and are given to children to chew in order to strengthen weak or bleeding gums[7].

propta Seed - sow in the autumn or the spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it could be worthwhile trying a sowing in situ in the autumn or the spring. Division in March or October[188]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in the spring[238]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Container, Massing, Rock garden, Seashore, Specimen. Succeeds in ordinary garden soil, especially if it is damp[1]. Prefers a neutral to alkaline soil[238]. Grows well in heavy clay soils. Grows well in marshy soils[24] and succeeds in shallow water at the edges of ponds[56]. Succeeds in full sun or partial shade[188]. A very hardy plant, tolerating temperatures down to at least -25°C[187]. This species can be very invasive and has been

## 4.2.171 *Solidago odora*

Sweet Goldenrod, Anise-scented goldenrod, Chapman's gold-enrod

3 tlin 7 cyuc 2 kcaak 2 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjltutnykifrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Solidago odora* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Condi-ment TeaLeaves - cooked[177]. Seed[177]. No more details are given but the seed is very small and fiddly to harvest[K]. An aromatic, anise-flavoured tea is made from the dried leaves and dried fully expanded flowers[21, 55, 95, 183]. The blossoms are used as a flavouring[102].

tcanta Dye EssentialAn anise-scented essential oil is obtained from the plant[61]. It is used medicinally[207] and in perfumery - especially for scenting soaps[245]. Mustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta Antiseptic Aperient Astringent Carminative Diaphoretic Diuretic Dysentery Febrifuge Stimulant Tonic UrinaryAn infusion of the dried powdered herb is antiseptic[168]. The leaves make a very pleasant-tasting tea that is mildly astringent, carminative, diaphoretic, diuretic, febrifuge and stimulant[21, 95, 207, 222, 257]. It is useful in the treatment of coughs and colds, dysentery and ulceration of the intestines[4, 257]. The essential oil has been used as a diuretic for infants, as a local application for headaches and for the treatment of flatulence and vomiting[4]. The flowers are aperient, astringent and tonic[4]. An infusion is beneficial in the treatment of gravel, urinary obstruction and simple dropsy[4]. The root can be chewed as a treatment for sore mouths[257].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in only moderately fertile moisture retentive soil in sun or semi-shade[200]. Tolerant of very poor sandy soils[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. The bruised leaves have a smell like a mixture of saffras and aniseed[245]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 4.2.172 *Cleome lutea*

Yellow Spiderflower, Jones spiderflower

3 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 1.2 m hkuc htut cyutli kyuctcup hwicli hrasjltut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Cleome lutea* is an ANNUAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4 and is frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic

(mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Young shoots - cooked[85]. Seed - ground into a meal and used as a flour[85].

tcanta DyeYields a black dye[85]. No further details are given, but it is probably obtained by boiling down the whole plant[K].

dwatta StingsThe plant has been used to treat ant bites[257].

propta Seed - surface sow or only lightly cover the seed in spring in a greenhouse[164]. The seed usually germinates in 5 - 14 days at 25°C[164]. When large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. Day time temperatures below 20°C depress germination but a night time fall to 20° is necessary[164].

nwatta Prefers a light fertile soil in a warm dry sunny position with plenty of room to spread[1, 200]. A frost tender plant, it can be grown as a summer annual in Britain[200].

## 4.2.173 *Rheum rhaponticum*

Rhubarb, Garden rhubarb

3 tlin 7 cyuc 2 kcaak 0 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli jltutnykifrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Rheum rhaponticum* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers StemEdible Uses: Leaf stem - raw or cooked[1, 2, 103]. An acid flavour, they are used as a fruit substitute in tarts etc[2]. The young flower pouch, harvested before the flowers open, is said to form a dish of great delicacy[2].

tcanta Plants can be grown for ground cover when spaced about 1.8 metres apart each way[208].

dwatta Astringent Purgative StomachicRhubarb has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[238]. The main species used is *R. palmatum*. Though the chemistry varies slightly, this species is used interchangeably[238]. Another report says that this species contains only small quantities of the medicinally active compounds and so it is only used as a mild laxative[244]. The root is anticholesterolemic, antiseptic, antispasmodic, antitumor, aperient, astringent, cholagogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 37, 57, 61, 171, 238]. Small doses act as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

plant to grow near the compost heap, aiding the fermentation process[20]. Trees are notably susceptible to honey fungus[200]. Special Features: North American native, Naturalizing, Inconspicuous flowers or blooms.

## 4.2.155 *Pinus aristata*

Bristle-Cone Pine

3 tlin 10 cyuc 2 kcaak 2 tcan 2 dwat 12 m hkuc htut cyutli hqatkyuctcup hwicli hyishrasjltut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta *Pinus aristata* is an evergreen Tree growing to 12 m (39ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: Condi-mentSeed-raw or cooked[160]. Up to 6mm long[200]. The oil-rich seed has a slightly resinous flavour. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide Preservative WoodLandscape Uses: Screen, Specimen. A tan or green dye is obtained from the needles[168]. The tree could be the source of antioxidants that contribute to long life[160]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - light, soft, not strong. Used for fuel and mining timber[46]. Special Features: Attractive foliage, North American native, Inconspicuous flowers or blooms. Can be grown in pots.

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4, 257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of

the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Thrives in a light well-drained sandy or gravelly loam[1]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. A wind tolerant tree, it often grows on very exposed ridges in the wild[229]. Trees grow best in areas with cold dry summers, the largest cultivated specimen is in dry sub-continental north-east Iceland[200]. A very slow growing[81] (to 6 metres in 60 years at Kew) and short-lived tree in Britain, though it lives for 2000 years or more in its native range[1, 185]. This is the oldest known living plant with specimens over 4000 years old[188]. This species is closely related to *P. balfouriana*[11]. The cones open and shed their seed whilst still attached to the tree[226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Heat zone: 9-1.

## 4.2.156 *Acer spicatum*

Mountain Maple

3 tlin 6 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc htut cyutli tcup hwicli hrasjltutnykifrip hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Acer spicatum* is a deciduous Tree growing to 10 m (32ft 10in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in May, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: SapEdible Uses: SweetenerA sugar is obtained from the sap. The sap can be used as a drink or boiled down to make maple syrup[183]. The syrup is used as a sweetener on many foods. The sap can be harvested in late winter, the flow is best on a warm sunny day after a frost. Trees on southern slopes in sandy soils give the best yields. The best sap production comes from cold-winter areas with continental climates.

tcanta Preservative Soil stabilization TanninThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. The bark contains tannins, but the report does not say in what quantity[223]. The trees have an extensive root system that can be used to bind the soil. They are often grown on banks in order to prevent soil erosion[226]. The wood is close-grained, soft and light, weighing 33lb per cubic foot[82, 235].

dwatta Astringent Ophthalmic PoulticeThe North American Indians made an infusion of the pith of young twigs and used this as eye drops to soothe irritation caused by campfire smoke[226, 257]. The pith itself was used to remove foreign matter from the eyes[257]. An infusion or poultice made from the outer bark has been used to treat sore eyes[257]. A poultice made from boiled root chips has been applied externally to wounds and abscesses[257]. A compound infusion of the roots and bark is used to treat internal haemorrhage[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Plants often self-layer in the wild[226]. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise

they are unlikely to survive the winter. Strong plants are usually produced by this method.

nwatta Landscape Uses:Specimen, Woodland garden. Of easy cultivation, it prefers a sunny position and a good moist well-drained soil but succeeds on most soils, especially those on the acid side, and dislikes alkaline soils[182]. Grows well in heavy clay soils. Plants are hardy to about -35°C when fully dormant. The lower branches of trees often self-layer, the trees then forming an impenetrable thicket[226]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:North American native, Attractive flowers or blooms.

### 4.2.157 Acer tataricum

Tatarian Maple

3 lin 7 cyuc 2 kcaak 0 tcan 0 dwat 9 m hkuc  
hmmihtut cyuti tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Acer tataricum is a deciduous Tree growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Sap SeedEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[74]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (A. saccharum). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. Seed - cooked[105, 177]. The wings are removed and the seeds are then boiled[2].

tcanta Companion PreservativeThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Container, Pollard, Standard, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil on the acid side and a sunny position[11, 182]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Trees usually fruit abundantly in Britain[11]. A bad companion plant, inhibiting the growth of nearby plants[18, 20]. Special Features:Not North American native, Fragrant flowers, Inconspicuous flowers or blooms.

### 4.2.158 Acer glabrum

Rock Maple, Rocky Mountain maple, Douglas maple, Greene's maple, New Mexico maple, Torrey maple  
3 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 9 m hkuc

hmmihtut cyuti tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Acer glabrum is a deciduous Tree growing to 9 m (29ft 6in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Inner bark Leaves SeedEdible Uses: CondimentEdible young shoots - cooked. They are used like asparagus[85]. The seedlings, gathered in early spring, are eaten fresh or can be dried for later use[213]. The dried crushed leaves have been used as a spice[257]. Seeds - cooked. The wings are removed and the seeds boiled then eaten hot[213]. The seeds are about 6mm long[82]. Inner bark[85]. No more details are given but inner bark is often dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread. An emergency food, it is usually only used when all else fails[85].

tcanta Containers Fibre Fuel Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. A fibre obtained from the inner bark is used for making mats, rope etc[99, 257]. The bark has been used to make spoons, paint containers etc[257]. Wood - tough, hard, heavy, close grained, pliable[82, 99]. It weighs 37lb per cubic foot[235]. The wood can also be used as friction sticks[99]. The green wood can be moulded.[99] The wood is too small for commercial exploitation, though it makes a good fuel[99, 229]. It was often used by native North American Indian tribes for making small items such as snowshoes, drum hoops, bows and pegs[257].

dwatta Antiemetic Birthing aid Cathartic GalactagogueA decoction of the wood and bark is said to cure nausea[213]. Another report says that this is specifically the nausea caused by smelling a corpse[257]. An infusion of the bark has been used as a cathartic[257]. A decoction of the branches, together with the branches of Amelanchier sp., was used to heal a woman's insides after childbirth and also to promote lactation[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. The seed has a hard coat and can be slow to germinate, often taking 2 years. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. It is very difficult to find suitable wood for cuttings.

nwatta Landscape Uses:Erosion control, Massing. Of easy cultivation, it succeeds in any soil, preferring a good moist well-drained soil[11]. Prefers a sunny position but tolerates some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Hardy to about -25°C[184]. This species grows well at Kew, a specimen was 12 metres tall in 1967[11]. The tree is almost fastigiate[11]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Trees are usually dioecious. Male and female trees must be grown if seed is required[226]. Special Features:North American native, Inconspicuous flowers or blooms.

### 4.2.169 Tanacetum vulgare

Tansy, Common tansy, Golden Buttons, Curly Leaf Tansy  
3 tin 9 cyuc 2 kcaak 4 tcan 2 dwat 1 m hkuc  
htut cyuti kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Tanacetum vulgare is a PERENNIAL growing to 1 m (3ft 3in) by 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaYoung leaflets - raw or cooked[5, 7, 13, 52, 53]. They can be added in small quantities to salads[183]. The plant is also used as a flavouring, it is a substitute for nutmeg and cinnamon[12, 27, 37, 55, 115]. This plant is not recommended for internal use[200]. The flowers have a unique flavour and are eaten or used as a garnish[183]. A bitter, somewhat lemon-flavoured tea is made from the leaves and flowering stems[183].

tcanta Compost Dye Essential Insecticide Repellent StrewingA green dye is obtained from the young shoots[4, 115]. The leaves and flowers can also be used and a yellow can also be obtained[169]. The plant is used as a strewing herb in cellars, churches etc in order to repel insects[4, 14, 20, 61, 201, 238]. Both the growing and the dried plant are said to repel flies, ants and fleas, especially if they are mixed with elder leaves (Sambucus spp.)[4, 12, 14, 18, 200, 201]. The leaves and the flowering shoots contain 0.15% of an essential oil that contains camphor, borneol and thujone[7, 213]. Both the leaves and the oil and they have been used to kill fleas and lice[213]. Thujone is an effective insecticide, but it is highly toxic to mammals when taken in excess[238]. The plant is a good addition to the compost heap, being valued for its mineral content[200]. Attractive flowers. Attracts wildlife. Landscape Uses:Container. Dynamic accumulator.

dwatta Anthelmintic Antirheumatic Antispasmodic Appetizer Bitter Carminative Emmenagogue Poultrice Stimulant TonicTansy is a commonly grown domestic remedy, useful in treating a wide range of complaints, though it is little used in modern herbalism[4, 254]. Its main value is as a vermifuge to expel intestinal worms and, to a lesser degree, to help stimulate menstrual bleeding[254]. Tansy should be used with caution, however, it is possibly unsafe for internal use, especially if you are pregnant[238]. The essential oil in the leaves is toxic and as little as ½oz can kill an adult[21, 222]. The leaves and flowering tops are anthelmintic, antispasmodic, bitter, carminative, emmenagogue, stimulant and tonic[4, 7, 9, 21, 46, 165]. An infusion of the leaves or whole plant is used to treat menstrual irregularities and as an anthelmintic, especially for children[4, 213]. It is also valuable in treating hysteria, kidney weaknesses, stomach problems, fevers and also as an emmenagogue[4]. In larger doses the plant can procure an abortion, though these doses can be poisonous[213]. Externally, tansy is used as a poultice on swellings and some eruptive skin diseases[4]. It is also used externally to kill lice, fleas and scabies, though even external use of the plant carries the risk of toxicity[254]. The plant is harvested as it is coming into flower and is dried for later use[4]. The seeds are used as an anthelmintic[207].

propta Seed - sow spring in a greenhouse. Only just cover the seed and do not allow the pot to dry out. Prick out the seedlings into individual pots once they are large enough to handle and plant out in the summer. Division is very simple at almost any time in the growing season, though spring is probably best. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Succeeds in an ordinary garden soil[1]. Plants thrive in almost any soil[4]. Tansy is occasionally grown in the herb garden, though a site for growing this plant should be selected with care since it usually spreads very aggressively at the roots[4, 14]. There are some named va-

rieties[238]. 'Fernleaf' is a more decorative compact form to about 75cm, it does not spread so quickly. A good plant to grow in the orchard, when grown under fruit trees, raspberries, roses etc it repels insects from them[201]. The flowering plant attracts hoverflies and butterflies. Special Features: Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 4.2.170 Grindelia squarrosa

Rosin Weed, Curlycup gumweed

3 tin 7 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc  
htut cyuti hgatkuyrcup hwicli hyishrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Grindelia squarrosa is a BIENNIAL/PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: Gum TeaThe fresh or dried leaves can be used to make an aromatic, slightly bitter but pleasing tea[183]. A sticky resinous sap that covers the leaves can be used as a chewing gum substitute[183].

tcanta Dye GumYellow and green dyes are obtained from the flowering heads and pods[168]. Aromatic.

dwatta Antispasmodic Eczema Expectorant Homeopathy Poultrice SedativeRosin weed was used by the native North American Indians to treat bronchial problems and also skin afflictions such as reactions to poison ivy[254]. It is still used in modern herbalism where it is valued especially as a treatment for bronchial asthma and for states where phlegm in the airways impedes respiration[254]. In addition, it is believed to desensitize the nerve endings in the bronchial tree and slow the heart rate, thus leading to easier breathing[254]. The plant merits investigation as a treatment for asthma[222]. The herb is contraindicated for patients with kidney or heart complaints[254]. The dried leaves and flowering tops are antiasthmatic, anti-inflammatory, antispasmodic, expectorant and sedative[4, 46, 207, 212, 238, 254]. The principal use of this herb is in the treatment of bronchial catarrh, especially when there is an asthmatic tendency, it is also used to treat whooping cough and cystitis[4, 254]. The active principle is excreted from the kidneys, and this sometimes produces signs of renal irritation[4, 238]. Externally, the plant is used as a poultice to treat burns, poison ivy rash, dermatitis, eczema and skin eruptions[212, 213, 222, 238]. The plant is harvested when in full bloom and can be used fresh as a poultice or dried for infusions etc[254]. A fluid extract is prepared by placing the freshly gathered leaves and flowers in a small quantity of simmering water for about 15 minutes[213]. A homeopathic remedy is prepared from the leaves and flowering stems[4].

propta Seed - sow autumn or spring in a cool greenhouse and only just cover the seed. Prick out the plants into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer. Division as new growth commences in the spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings.

nwatta Industrial Crop: Hydrocarbon Management: Hay Wild CropSucceeds in any well-drained soil in full sun[200]. Does well on dry sandy banks and in poor soils[200]. Prefers a peaty loam soil[1]. This is one of the first species to invade disturbed or denuded ground and often becomes a serious weed of grazing land[212]. A very polymorphic plant[43].



well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Not very palatable[183].

tcanta None known  
dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. This is a bi-generic hybrid and, if seed is produced, it is unlikely to breed true. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a sunny position in a well-drained moisture-retentive humus-rich lime-free soil[200]. This species probably tolerates some lime in the soil[200]. Succeeds in semi-shade though it fruits less well in such a position[200]. Hardy to about -20°C[200]. Plants are surprisingly vigorous in British gardens[11]. A naturally occurring bi-generic hybrid, *Amelanchier alnifolia* semi-integrifolia x *Sorbus scopulina*, it is very variable in the wild[182, 200].

## 4.2.167 Aruncus dioicus

Goat's Beard, Bride's feathers

3 tin 7 cyuc 2 kcak 0 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli kyuctcuphja7n hwicli hrasjltutnyik hpa7tli  
frusflatprkllwisslip hpa7tmwatli nyanhjen hjonli

drutta *Aruncus dioicus* is a PERENNIAL growing to 2 m (6ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Budlings, stems and young leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta Plants form a dense growth that is very effective at holding invasive plants at bay[208]. They can be used as a tall ground cover for large areas[208].

dwatta Antipyretic Astringent Birthing aid Salve Stings Stomachic VDTThe poulticed root is applied to bee stings[222, 257]. A tea made from the roots is used to allay bleeding after child birth, to reduce profuse urination and to treat stomach pains, diarrhoea, gonorrhoea, fevers and internal bleeding[222, 257]. The tea is used externally to bathe swollen feet and rheumatic joints[222, 257]. A salve made from the root ashes is rubbed onto sores[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Sow stored seed in late winter or early spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame until they are at least 15cm tall. They can be planted out into their permanent positions at any time of the year. Division in early spring or autumn[200]. Very easy, the clumps can be planted out direct into their permanent positions.

nwatta Landscape Uses:Border, Massing, Seashore, Specimen, Woodland garden. Succeeds in most moist soils in sun or partial shade[187, 200, 233]. Plants do well in moist

to wet soils but will also tolerate fairly dry sites[208]. Succeeds in acid or limey soils[208]. Grows well on the woodland edge[200]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Plants are hardy to at least -20°C[187]. This is a polymorphic species, especially the form that grows in Japan[187]. There are some named forms selected for their ornamental value, 'Kneiffii' is only half the size of the type species[208]. Plants are fast-growing[208] and form very large clumps[187]. The flowers are sweetly perfumed[245]. Dioecious, male and female plants must be grown if seed is required[208]. Special Features:Attractive foliage, Naturalizing, Wetlands plant.

## 4.2.168 Eleutherococcus senticosus

Siberian Ginseng

3 tin 7 cyuc 2 kcak 0 tcan 5 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjltutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Eleutherococcus senticosus* is a deciduous Shrub growing to 2 m (6ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves and buds - cooked[105, 177]. The dried leaves are used as a tea substitute[105, 177].

tcanta None known

dwatta Adaptogen Antiinflammatory Hypoglycaemic Tonic VasodilatorSiberian ginseng is a powerful tonic herb with an impressive range of health benefits. Unlike many herbs with a medicinal use, it is more useful for maintaining good health rather than treating ill health. Research has shown that it stimulates resistance to stress and so it is now widely used as a tonic in times of stress and pressure[254]. This plant is a very commonly used folk treatment in China and Russia where it is used as a ginseng substitute[218]. It is a pungent bitter-sweet warming herb that is said to be stronger in its action than ginseng[238]. Regular use is said to restore vigour, improve the memory and increase longevity[218]. The root and the root bark are adaptogen, anti-inflammatory, hypoglycaemic, tonic and vasodilator. It is taken internally during convalescence and in the treatment of menopausal problems, geriatric debility, physical and mental stress etc[238]. It works by strengthening the bodies natural immune system[140, 165, 176, 238]. It has also been used to combat radiation sickness and exposure to toxic chemicals[200, 218, 238]. This herb is not prescribed for children, and should not be used for more than 3 weeks at one time[238]. Caffeine should not be taken when using this herb[238]. The roots are harvested in the autumn and dried for later use[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Eleutherococcus senticosus* for tendency to infection, lack of stamina (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season's growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Prefers a light warm open loamy humus-rich soil and a position sheltered from north and east winds[11, 200]. Prefers a well-drained soil and full sun[200]. (A surprising report, this species is a woodland plant and we would expect it to prefer shade[K]) Tolerates urban pollution and poor soils[200]. Plants are hardy to at least -15°C if they are sheltered from cold winds[200]. A highly polymorphic species[74]. Siberian ginseng is cultivated as a medicinal plant in Russia and China[140].

## 4.2.159 Celastrus scandens

Climbing Bittersweet, American bittersweet  
3 tin 8 cyuc 2 kcak 0 tcan 2 dwat 8 m hkuc  
pcimhimhtut cyutli tcup hwicli hrasjltutnyik hpa7tli flatprk hpa7tmwatli nyanhjen hjonli

drutta *Celastrus scandens* is a deciduous Climber growing to 8 m (26ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from July to August, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Bark and twigs - they must be cooked[105]. The thickish bark is sweet and palatable after boiling[2, 161, 177]. Another report says that it is the inner bark that is used, and that it is a starvation food, only used when other foods are in short supply[257]. Some caution is advised in the use of this plant since there are suggestions of toxicity.

tcanta None known

dwatta Analgesic Antirheumatic Cancer Cardiac Diaphoretic Diuretic Dysentery Emetic SkinClimbing bitter-sweet was employed medicinally by a number of native North American Indian tribes, though it is scarcely used in modern herbalism[257]. The root is diaphoretic, diuretic and emetic[222]. It is a folk remedy for chronic liver and skin ailments (including skin cancer), rheumatism, leucorrhoea, dysentery and suppressed menses[222]. A strong compound infusion, usually combined with raspberry leaf tea, has been used to reduce the pain of childbirth[257]. A poultice of the boiled root has been used to treat obstinate sores, skin eruptions etc[257]. Externally, the bark is used as an ointment on burns, scrapes and skin eruptions[222]. Extracts of the bark are thought to be cardioactive[222]. Many plants in this genus contain compounds of interest for their antitumour activity[218].

propta Seed - gather when ripe, store in dry sand and sow February in a warm greenhouse[78]. Three months cold stratification leads to a higher germination rate[113]. Remove the flesh of the fruit since this inhibits germination[113]. Germination rates are usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in August of the current seasons growth. Takes 12 months[78]. Root cuttings, 6mm thick 25mm long in December. Plant horizontally in pots in a frame[78].

nwatta Landscape Uses:Arbor. Prefers a deep loamy soil[11]. Dislikes chalky soils[108]. Succeeds in full or partial shade[188]. Requires a humus-rich soil if it is to be at its best[219]. A rampant climber, it requires ample space and is best grown into an old tree. It climbs by means of twining and also by prickles on the young stems[182]. Plants do not normally require pruning[219]. The foliage of some wild plants is variegated[235]. There are some named forms, selected for their ornamental value[200]. A good bee plant[108]. Plants in this genus are notably resistant to honey fungus[200]. Plants are usually dioecious, in which case male and female plants must be grown if seed is required[182]. This species seldom fruits freely in Britain[182]. Special Features: Attracts birds, North American native, Invasive, Attracts butterflies, Suitable for dried flowers, Inconspicuous flowers or blooms.

## 4.2.160 Viburnum prunifolium

Stagberry, Black Haw, Hybrid blackhaw, Smooth Blackhaw, Blackhaw Viburnum

3 tin 9 cyuc 2 kcak 0 tcan 3 dwat 7.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasjltutnyik hpa7tli flatprklwis hpa7tmwatli dyatxre7t hjonli

drutta *Viburnum prunifolium* is a deciduous Tree growing to 7.5 m (24ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in

flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 5, 55, 62, 200, 257]. A thin dry flesh with a sweet taste[11, 159, 227]. The fruit is somewhat variable in size and quality, the best forms are nice raw whilst others are used for making preserves etc[183]. The taste is best after a frost[22, 46, 61]. The ovoid fruit is about 17mm long and contains a single large seed[200].

tcanta Hedge Hedge WoodPlants can be grown as a hedge, they can be sheared to make a formal screen[200]. Wood - heavy, hard, strong, brittle, close grained[82]. It weighs 52lb per cubic foot, but is of no commercial importance due to the small size of the trees[227, 229].

dwatta Abortifacient Anodyne Antispasmodic Astringent Birthing aid Dysentery Nerve SedativeStagberry was used by the North American Indians to treat dysentery and to arrest haemorrhage of the uterus[254, 257]. It is now considered to be a specific treatment for the relief of menstrual pain - the bark contains 'scopoletin', a coumarin that has a sedative affect on the uterus and salicin, a painkiller that is used in making aspirin[238, 254]. The bark of the root and stems is abortifacient, anodyne, antispasmodic, astringent, nerve and sedative[9, 46, 165, 222]. A tea is used internally in the treatment of painful or heavy menstruation, prolapse of the uterus, morning sickness, to prevent miscarriage and to relieve spasms after childbirth[222, 238, 254]. It is also used to treat convulsive disorders, colic and other cramping pains that affect the bile ducts, hysteria, asthma and palpitations of a nervous origin[238, 254]. The stem bark is harvested in the autumn before the leaves change colour, or in the spring before the leaf buds open[238]. The root bark is only harvested in the autumn[254]. Both barks can be dried for later use[238].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Screen, Specimen. An easily grown plant, succeeding in most soils[11]. Unlike other members of the genus, this species grows well on poor soils and in dry situations[200]. Prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. A very hardy plant, tolerating temperatures down to about -40°C[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Special Features:Attracts birds, Attractive foliage, North American native, Attracts butterflies, Fragrant flowers, Attractive flowers or blooms.

## 4.2.161 *Malus angustifolia*

Southern Crab, Southern crab apple  
3 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 7 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Malus angustifolia* is a deciduous Tree growing to 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[61, 105]. A fragrant aroma, but the fruit is harsh and acid[11]. The hard sour fruits are often used for making preserves, cider, jellies etc[46, 82, 183]. The fruit is about 25mm in diameter and is slightly pear-shaped[200].

tcanta WoodWood - hard, heavy, close grained[46, 61, 82, 229]. It weighs 43lb per cubic foot[235]. Of no commercial value, but it is used locally for making levers, tool handles and other small objects[46, 61, 82, 229].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta Landscape Uses:Border, Specimen. An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The flowers have a perfume of violets[245]. A short-lived tree in the wild[229]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:North American native, Fragrant flowers, Attractive flowers or blooms.

## 4.2.162 *Malus ioensis*

Prairie Crab, Prairie crab apple, Texas crab apple, Prairie Crabapple

3 tin 8 cyuc 2 kcaak 2 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Malus ioensis* is a deciduous Tree growing to 5 m (16ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from May to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 159, 183, 257]. Up to 4cm in diameter[229]. Harsh and astringent[1, 227, K], it is best baked or made into preserves. It makes excellent jellies and cider[229].

tcanta WoodWood - heavy. Of no commercial importance[229]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and

should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta Landscape Uses:Border, Specimen. An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Dislikes chalky soils, this is especially true for the cultivar 'Plena'[200]. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[200]. A slow-growing and short-lived species in the wild[229], it produces suckers from the roots and often forms thickets[228]. This species is closely related to *M. coronaria*[1]. It hybridizes freely with other members of the genus[200]. There are many named forms, selected for their ornamental value[200]. The fruit is a good wildlife food source, especially for birds[200]. The plant fruits very heavily in southern Britain[K]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:North American native, Fragrant flowers, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 4.2.163 *Zanthoxylum americanum*

Prickly Ash - Northern, Common pricklyash, Northern Prickly Ash

3 tin 7 cyuc 2 kcaak 2 tcan 3 dwat 4 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Zanthoxylum americanum* is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentSeed - cooked. It is used as a condiment. A pepper substitute[106]. The fruit is rather small, about 4 - 5m in diameter[229], but is produced in dense clusters which makes harvesting easy[K]. Each fruit contains a single seed[229].

tcanta EssentialAgroforestry Uses: The plant's prickly nature and suckering habit can produce an effective barrier[277 ] . Other Uses: The fruits have been used by young men as a perfume[257 ] . Wood - soft. It weighs 35lb per cubic foot[235 ] . Of little use[229 ] .

dwatta Anodyne Antirheumatic Antispasmodic Carminative Diaphoretic Diuretic Dysentery Irritant Odontalgic Sialagogue Skin StimulantPrickly ash is a warming, stimulating herb that is beneficial for the circulation. It was highly regarded by the native North American Indians who used it especially to alleviate rheumatism and toothache[254]. All parts of the plant, but especially the bark and roots, contain the aromatic bitter oil xanthoxylin[229]. This has a number of applications in medicine, especially in the treatment of arthritic and rheumatic conditions, digestive problems and leg ulcers[229, 254]. The fruit has a similar medicinal action to the bark[4]. The bark and roots are irritant, odontalgic and antirheumatic[213]. Along with the fruit they are diaphoretic, stimulant and a useful tonic in debilitated conditions of the stomach and digestive organs[4]. They produce arterial excitement and are of use in the treatment of fevers, ague, poor circulation etc[4]. The fruits are considered more active than the bark, they are also antispasmodic, carminative, diuretic and antirheumatic[4, 213, 222].

The pulverized root and bark are used to ease the pain of toothache[213, 222]. One report says that it is very efficacious, but the sensation of the acrid bark is fully as unpleasant as the toothache[213]. Chewing the bark induces copious salivation[222]. Rubbing the fruit against the skin, especially on the lips or in the mouth, produces a numbing effect[K]. A tea or tincture of the bark has been used in the treatment of rheumatism, dyspepsia, dysentery, heart and kidney troubles etc[222]. A tea made from the inner bark has been used to treat itchy skin[213, 257].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may require up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, removed in late winter and planted into their permanent positions[113].

nwatta Landscape Uses:Border, Massing. Prefers a good deep well-drained moisture retentive soil in full sun or semi-shade[1, 11, 200]. A relatively fast-growing plant in the wild, it often forms thickets by means of root suckers[229]. All parts of the plant are fragrant. The bruised foliage has a delicious resinous orange-like perfume[245]. Dioecious. Male and female plants must be grown if seed is required. Flowers are formed on the old wood[206]. Special Features:North American native, Attracts butterflies, Inconspicuous flowers or blooms. Blooms appear periodically throughout the year. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 4.2.164 *Cotoneaster racemiflorus*

Black-Wood, Cotoneaster

3 tin 7 cyuc 2 kcaak 2 tcan 1 dwat 2.4 m hkuc  
hmimhtut cyutli kyuctup hwicli hyishrasljutnyikfripr hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta *Cotoneaster racemiflorus* is a deciduous Shrub growing to 2.4 m (7ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: MannaEdible Uses: Yields a manna-like substance called shir-khist, it is rich in sugars[46, 61, 183]. It contains about 13% saccharose, 37.5% dextrose[105, 183]. No details of which part of the plant yields the manna, it is most likely to be the stem.

tcanta Basketry Dye WoodA rose-tan dye is obtained from the fruit[168]. The wood is used in basket making.

dwatta Aperient Expectorant StomachicThe plant is aperient, expectorant and stomachic[240].

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°C and then 3 months cold stratification at 4°C[164]. The seed usually germinates within 1 - 18 months at 15°C but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings

of half-ripe wood with a heel, July/August in a frame[11, 200]. Cuttings of mature wood of the current year's growth, preferably with a heel, November in a frame.

nwatta An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Tolerates atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -25°C[200]. Hybridizes freely with other members of this genus[200]. There are several sub-species[200]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Trees are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 4.2.165 *Filipendula kamschatica*

3 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasljutnyikfripr hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Filipendula kamschatica* is a PERENNIAL growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - raw[74]. Leaves - cooked[74]. Root - raw or cooked[74].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame[1]. The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[188, 200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a humus-rich moist soil in semi-shade[1, 200]. Succeeds in full sun only if the soil is reliably moist throughout the growing season[200]. Dislikes dry or acid soils. Does well in marshy soils. Grows well in heavy clay soils. Plants are hardy to about -25°C[187], when growing in shallow water they even survive if the water is frozen[245]. A good bee plant, the flowers also attract flies. The flowers have a powerful, sweet scent when inhaled from a distance, though there are fishy undertones when inhaled near to[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.166 *Amelisorbus jackii*

Jack's amelisorbus

3 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Amelisorbus jackii* is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

## 4.2.394 Adonis amurensis

3 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Adonis amurensis is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from February to March, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Cardiotonic Diuretic SedativeThe root is cardiotonic[174, 218]. The whole plant is an effective diuretic and tranquilliser[218].

propta Seed - best sown in a cold frame as soon as it is ripe or else it can be slow to germinate[1]. Sow the seed in partial shade in rich soil in September or March[111]. When large enough to handle, prick the seedlings out into individual pots and grow the plants on for their first winter in a cold frame. Plant out in late spring or early summer. Division in early spring or in autumn. The divisions can be difficult to establish[200], so it is probably best to pot them up first and keep them in a cold frame or greenhouse until they are growing away actively.

nwatta Grows well in ordinary garden soil and in the light shade of shrubs[1, 111]. Prefers a sunny position and a humus-rich soil[111]. Prefers a moist well-drained soil in sun or semi-shade[200]. A very ornamental plant[1]. A greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Plants take about 4 years from seed to flowering[111].

## 4.2.395 Dennstaedtia punctilobula

Hay-scented fern

3 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Dennstaedtia punctilobula is an evergreen Fern growing to 0.6 m (2ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None Known

tcanta Groundcover: Works well as a groundcover for shaded areas. Grows with a low to medium coverage density, but will quickly take over large areas and isn't advised for small gardens. Wildlife Habitat: ay scented fern provides good cover for wildlife when growing in large colonies. Ornamental: Lacy triangular fronds. Light green during summer turning shades of yellow/copper during autumn. Aromatic/Fragrance: The fronds emit a scent reminiscent of hay or cut grass when they are brushed, bruised, or crushed [318-1]. A good fern for naturalizing in woodland areas, shade gardens, cottage gardens or wild areas [368-1].

dwatta None known

propta Propagate by spores or rhizome division. Cut rhizomes between fronds, set apart and trim back at least half of each frond.

nwatta A temperate fern. Sun: Partial Shade, Shade. Soil Type: Sandy, Loamy, Silty, Clay. Tolerates a wide range of soils, including poor rocky soils and, once well established, dry soils [368-1]. Soil pH: 4.5 - 6.8. Soil Moisture: Moderate, Dry. Grows best in rich, humus soils. Can tolerate full sun if given enough moisture. Spreads aggressively. One of the first ferns to colonize after fire. Growth Rate: Fast. Life Span: Long-Lived Perennial. Stand Persistence: Long. Form: Clump. Texture: Medium. Root Type: Rhizome. Fungal Types: Endomycorrhizal. Seasonal Interest: Spring-Summer. USDA Hardiness Zones: 3 - 8. Drought: Tolerant.

Flood: Moderate. Salt: Moderate. Soil Compaction: Tolerant. Mowing: Intolerant. Fire Damage: Moderate. Cold Injury: Infrequent. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer, Rabbits [318-1]. In this ecological community, you'll typically see Hay-scented Ferns growing among wildflowers such as goldenrods, hawkweeds, dandelions, Oldfield Cinquefoil, Common Evening Primrose, Field Chickweed, New England Aster, and Queen Anne's Lace. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.396 Symphytum orientale

White comfrey

3 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Symphytum orientale is a deciduous Perennial growing to 0.8 m (2ft 6in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta None Known. Other species in this family have some edible uses but we could find no information for Symphytum orientale.

tcanta The plant grows very quickly, producing a lot of bulk. It is tolerant of being cut several times a year and can be used to provide 'instant compost' for crops such as potatoes. Simply layer the wilted leaves at the bottom of the potato trench or apply them as a mulch in no-dig gardens. A liquid feed can be obtained by soaking the leaves in a small amount of water for a week, excellent for potassium demanding crops such as tomatoes. The leaves are also a very valuable addition to the compost heap[26, 200]. A gum obtained from the roots was at one time used in the treatment of wool before it was spun[100]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Landscape Uses: Border, Ground cover, Specimen. One of the more attractive comfrees. A good bee plant.

dwatta None Known. Other species in this family have good medicinal properties but we could find no information for Symphytum orientale

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta A clump-forming, hairy, herbaceous to semi-evergreen perennial. Bell-shaped, white flowers in early summer. Tolerates moist soils and situations but prefers a moist soil and some shade[1, 4]. Grows well in heavy clay soils. Best grown in an open sunny site in a deep rich soil if it is being grown for compost material[200]. Not as invasive as other Symphytum species. The root system is very deep and difficult to eradicate, even small fragments of root left in the soil can produce new plants. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over

heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[2, 115]. The young spring shoots are finely chopped and added to salads[4, 7, 183]. Rather pungent[9], they should be used sparingly or mixed with other salad plants[183]. Root - raw[5]. Used in spring[207].

tcanta Groundcover and Specialist Nectary. Landscape Uses: Ground cover, Massing. Special Features: Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers.

dwatta Antispasmodic Antitussive Diaphoretic Diuretic Emmenagogue Tonic VulneraryThe whole plant, and especially the flowers[7], is antispasmodic, antitussive, diaphoretic, diuretic, emmenagogue, tonic and vulnerary[4, 7, 21]. It is harvested in May and June then dried for later use[4]. The plant has been employed successfully in the treatment of whooping cough, asthma and nervous excitability[4]. Externally it is used as a lotion on bruises, wounds, ulcers and some cutaneous diseases[4, 7]. A decoction of the dried flowers and stems has been used as a wash for chapped hands[257]. A distilled water made from the flowers is an effective eye lotion in the treatment of conjunctivitis[7].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in spring. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Easily grown in a good garden soil in a sunny position[187]. Prefers a rich soil[17]. Plants are hardy to at least -20°c[187]. The whole plant is permeated with an acrid juice, making it obnoxious to insects[4]. The flowers have a smell like stale perspiration[245]. Grows well in the summer meadow but may need some help in maintaining itself[24]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 4.2.236 Clintonia udensis

3 tlin 7 cyuc 2 kcak 0 tcan 0 dwat 0.3 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Clintonia udensis is a PERENNIAL growing to 0.3 m (1ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and shoots - cooked as a vegetable[177, 272].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the spring[200]. Stored seed should be sown in late winter or early spring in a cold frame[164]. It sometimes germinates within 1 - 3 months at 15°C, but may take a year. The seed should be completely separated from the fruit and should only just be covered by soil[164, 200]. If the seed has been sown thinly enough, then it is possible to leave the seedlings in the pot for their first growing season, dividing them after they become dormant. Make sure to give them liquid feeds at intervals through the spring and summer. Otherwise prick out the seedlings into individual pots when they are large enough to handle. Plant out in late spring or early summer at the beginning of

their second or third years growth. Division in spring as new growth is just commencing[200].

nwatta Prefers a damp peaty sandy soil in a cool damp shady position[1, 42, 200]. Requires a moist neutral to acid soil[200]. Dormant plants are hardy to at least -25°C, but the new growth in spring can be damaged by late frosts[187]. Plants only produce their fruit in warm seasons in Britain[200].

## 4.2.237 Sedum ternatum

Woodland stoncrop or Wild stoncrop

3 tlin 9 cyuc 2 kcak 2 tcan 0 dwat 0.2 m hkuc pcmhmimhtut cyutli hgatkycup hwicli hrasjlutnyik hpa7tli priklwisslip hpa7tmwatli hjonli

drutta Sedum ternatum is an evergreen Perennial growing to 0.2 m (0ft 6in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Leaves. Succulent young leaves [1-2].

tcanta Ground cover including semi-shade. A good rock gardens plant. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. The flower nectar and pollen of stoncroops (Sedum spp.) attract various kinds of bees, including Andrena forbesi (Krombein et al., 1979). Less often, wasps and flies visit flowers of these plants. Insects that feed on the foliage of Wild Stoncrop (Sedum ternatum) include the Sedum Aphid (Aphis sedi) and the aphid Aphis acrita. The Eastern Chipmunk eats the roots of this plant (Wrazen and Svendsen, 1978).

dwatta None known

propta Division, Cuttings. Easy - divide or cut stems and lay on potting soil or place shallowly into the potting soil.

nwatta The preference is partial sun to light shade, moist to dry-mesic conditions, and a loamy or rocky soil. Tolerates part shade and moist soils better than most other sedums. Bloom Time: April to May. Bloom Description: White. Flower: Showy. Attracts: Bees, Butterflies. Tolerates rabbit, deer, drought, air pollution. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

## 4.2.238 Elymus canadensis

Canadian Wild Rye

3 tlin 7 cyuc 2 kcak 0 tcan 0 dwat 0.8 m hkuc htut cyutli hgattcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Elymus canadensis is a PERENNIAL growing to 0.8 m (2ft 7in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[105, 161, 177]. It can be ground into a flour and used to make bread. Quite fiddly to use, the seed is small and difficult to separate[K]. The seed was an important item of food for the Paiute Indians of south-western N. America[183].

tcanta Soil stabilizationThe plant has an extensive root system and can be used for binding sand dunes[61].

dwatta None known

propta Seed - sow mid spring in situ and only just cover the seed[162]. Germination should take place within 2 weeks. If the supply of seed is limited, it can also be sown in

mid spring in a cold frame. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in summer[K] Division in spring or summer[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, it succeeds in most soils, preferring a sandy soil and a sunny position[1, 162]. Plants can flower too late to ripen their seed in Britain, especially in the western half of the country[K]. A polymorphic species[1].

### 4.2.239 *Clintonia borealis*

Bluebeard

3 tlin 7 cyuc 2 kca2 2 tcan 1 dwat 0.3 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta *Clintonia borealis* is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[61, 105, 177]. Harvested in spring before they fully unfurl[62], they have a slightly sweetish cucumber flavour[55, 183]. Older leaves can be used as a potherb[55].

tcanta Disinfectant RepellentThe crushed leaves have been rubbed on the face and hands as a protection from mosquitoes[257].

dwatta Cardiac Disinfectant PoulticeThe leaves are cardiac and disinfectant[257]. A poultice has been applied to open wounds, burns, ulcers, scrofulous sores and infections[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the spring[200]. Stored seed should be sown in late winter or early spring in a cold frame[164]. It sometimes germinates within 1 - 3 months at 15°C, but may take a year. The seed should be completely separated from the fruit and should only just be covered by soil[164, 200]. If the seed has been sown thinly enough, then it is possible to leave the seedlings in the pot for their first growing season, dividing them after they become dormant. Make sure to give them liquid feeds at intervals through the spring and summer. Otherwise prick out the seedlings into individual pots when they are large enough to handle. Plant out in late spring or early summer at the beginning of their second or third years growth. Division in spring as new growth is just commencing[200].

nwatta Prefers a damp peaty sandy soil in a cool damp shady position[1, 42, 200]. Requires a moist neutral to acid soil[200]. The dormant plant is hardy to at least -25°C, but new growth in spring can be damaged by late frosts[187]. Plants only produce their fruit in warm seasons in Britain[200]. They have creeping underground stems and form dense colonies[187]. This species is closely related to *C. andrewsiana*[188]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.240 *Osmunda claytoniana*

Interrupted Fern

3 tlin 7 cyuc 2 kca2 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli frusflatprikkwis hpa7tmwatli hjonli

drutta *Osmunda claytoniana* is a FERN growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves StemEdible Uses: The young fronds are eaten[183]. Cooked as a vegetable[177, 272]. The centre of the clump, below ground level, is the source of a small edible pith called 'fern butter'[183].

tcanta None known

dwatta VermifugeThe roots are used as an adulterant for *Dryopteris felix-mas* in the treatment of internal worms[240].

propta Spores - they very quickly lose their viability (within 3 days) and are best sown as soon as they are ripe on the surface of a humus-rich sterilized soil in a lightly shaded place in a greenhouse. Keep the compost moist, preferably by putting a plastic bag over the pot. Plants develop very rapidly, pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Cultivars usually come true to type[200]. Division of the rootstock in the dormant season. This is a very strenuous exercise due to the mass of wiry roots[200].

nwatta Likes a soil of swamp mud and loamy or fibrous peat, sand and loam[1]. Succeeds in most moist soils, preferring acid conditions[200]. Requires a constant supply of water, doing well by ponds, streams etc[1]. Plants thrive in full sun so long as there is no shortage of moisture in the soil and also in shady situations beneath shrubs etc[200]. Requires a shady position[188]. Plants are hardy to at least -20°C, they are evergreen in warm winter areas but deciduous elsewhere[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1].

### 4.2.241 *Sambucus mexicana*

Mexican Elder

3 tlin 9 cyuc 2 kca2 0 tcan 1 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Sambucus mexicana* is a deciduous Shrub growing to 1 m (3ft 3in). It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers FruitEdible Uses: Flowers - raw or cooked[183]. Fruit - raw or cooked[257]. It is usually dried before being used since this reduces a somewhat rank taste[177, 181, 183]. The fruit can be used in making pies, preserves, winemaking etc[183]. The fruit is about 6mm in diameter and is borne in large clusters[227]. Some caution is advised, see the notes above on toxicity.

tcanta Dye WoodA purple to black dye is obtained from the fruits[257]. Wood - soft and coarse-grained[27].

dwatta Febrifuge Laxative StomachicAn infusion of the blossoms has been used in the treatment of upset stomachs, fevers, sore throats, colds and flu[257]. A decoction of the roots has been used in the treatment of constipation[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered

nwatta Landscape Uses:Border, Container, Massing, Specimen, Woodland garden. Prefers a moist non-acid soil and a sunny position[17, 24, 42]. Succeeds in any soil, preferring a light soil with plenty of humus[1, 90]. Succeeds in sun or light shade[1, 90]. Grows well in short turf[108]. A very ornamental plant[1], it often self-sows when in a suitable position. Rabbits are very fond of this plant and will destroy it wholesale if given the opportunity[4]. A good plant for the spring meadow[24, 90, 134]. The flowers are very attractive to bees[108]. Plants should not be allowed to dry out in the summer[90]. Special Features: Attractive foliage, Naturalizing, Flowers have an unpleasant odor, Attractive flowers or blooms.

### 4.2.391 *Carex sylvatica*

Wood sedge

3 tlin 8 cyuc 0 kca2 3 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli tcuphja7n hwicli ljutnyikfrip hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta *Carex sylvatica* is an evergreen Perennial growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind, Insects. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta InsulationA good evergreen ground cover supplying winter interest. Can be used on slope or Banks. Good in containers. Can make a good edging plant. Deer resistant and shade tolerant. Recommended as a groundcover under trees and shrubs. Wildlife Habitat - provides cover for small wildlife. Fiber. *C. sylvatica* was used as wadding in order to retain heat by Laplanders (English Botany. Sowerby and Smith, 1802). Ornamental [318-1].

dwatta None Known

propta Propagate by plant division in spring or seeding in the fall.

nwatta *C. sylvatica* is a clump-forming, log-lived, evergreen to semi-evergreen perennial 0.15m to 0.6m (6 inches - 24 inches) high and a spread of 0.15m to 0.6m (6 inches - 24 inches). It has a moderate Growth Rate. It prefers sun to partial shade and loamy to clay soil. Soil moisture is wet, to moderate and soil pH: 5.8 - 7.0. it is drought intolerant. There are a few distinct subspecies. It can be evergreen or deciduous. Non-mycorrhizal. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length.

### 4.2.392 *Potentilla simplex*

Old Field Cinquefoil, Common cinquefoil

3 tlin 7 cyuc 0 kca2 0 tcan 1 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli fyfixre7t hjonli

drutta *Potentilla simplex* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antiseptic Astringent DysenteryThe plant is mildly astringent and antiseptic[207]. A decoction is used as a gargle for loose teeth and spongy gums[207, 257]. An infusion of the roots has been used in the treatment of dysentery[257].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their

permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Plants grown in rich soils produce more foliage at the expense of flowering[200]. Hardy to about -25°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.393 *Arnica angustifolia alpina*

Mountain Tobacco

3 tlin 7 cyuc 0 kca2 0 tcan 3 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Arnica angustifolia alpina* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta HairThis plant is used as a hair conditioner[172]. No further details are given.

dwatta Antiechymotic Antiphlogistic Epilepsy Nervine Sternutatory VulneryThe whole flowering plant is antiechymotic, antiphlogistic, nervine, sternutatory and vulnerary[172]. This species is closely related to *A. montana* and is included in that species by some botanists. The medicinal uses of that plant are as follows:- Arnica has a long history of herbal use, especially as an external treatment for bruises and sprains[232, 238] - it is an ingredient of a number of proprietary preparations[238]. Internally, it has been used in the treatment of heart complaints and as a booster to the immune system[238]. Arnica increases local blood supply and accelerates healing, it is anti-inflammatory and increases the rate of absorption of internal bleeding[254]. Generally the plant is nowadays only recommended for internal use as a homeopathic medicine, principally for treating shock, injury and pain[254]. If used as a decoction or tincture it stimulates the circulation and is valuable in the treatment of angina and a weak or failing heart, but it can be toxic even at quite low doses and so is rarely used this way[254]. The flowers are the part most commonly used[4, 232], they are harvested when fully open and dried - the receptacles are sometimes removed since these are liable to be attacked by insects[4]. The root is also used, it is harvested after the leaves have died down in the autumn and dried for later use[4]. The whole plant is antiechymotic, antiphlogistic, nervine, sternutatory, vulnerary[4, 7, 9, 46, 165]. Although a very valuable remedy, it should be used with caution. It has been known to cause contact dermatitis when used externally and collapse when taken internally[238]. Only take it internally under the supervision of a qualified practitioner. The freshly crushed flowers cause sneezing if inhaled[232]. The leaves have also been smoked as a tobacco[232], though it is unclear whether this was for medicinal reasons The whole plant, harvested when in flower, is used in homeopathic remedies[232]. It is especially useful in the treatment of traumatic injuries, sores and bruises[232]. The homeopathic dose has also been used effectively in the treatment of epilepsy and seasickness, and it might be of use as a hair growth stimulant[268].

propta Seed - sow early spring in a cold frame[200]. Only just cover the seed and make sure that the compost does not dry out. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Prefers a moist, well-drained humus rich soil, preferably lime-free[200]. This species is more lime tolerant than other members of the genus[200]. Prefers a mixture of sand, loam and peat[1]. Closely related to *A. montana*[268].

the root has been used in the treatment of rheumatism[257]. A warm infusion, held in the mouth, has been used to treat toothaches[257].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Ground cover, Specimen, Woodland garden. Prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position. Succeeds in full sun but grows best in a shady position with only 2 - 3 hours sun per day[200]. Tolerates a pH range from 4.5 to 7[200]. Dislikes heavy clay. Prefers a good supply of water at its roots but succeeds in dry shade and tolerates drought when it is established. A very hardy plant, tolerating temperatures down to about -30°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Hybridizes in the wild with several other species[187]. Special Features: Attractive foliage, North American native, Wetlands plant, There are no flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.388 *Alchemilla mollis*

Lady's-mantle

3 tlin 8 cyuc 0 kcaak 3 tcan 0 dwat m hkuc pckimhmhtut cyuti tu cp hwicli hrasjlutnykfrip hpa7tli flatprikklwis hpa7tmwatli fyf7t hjonli

drutta *Alchemilla mollis* is a deciduous Perennial growing to 0.6 m (2ft) by 0.8 m (2ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta None Known  
tcanta A good ground cover plant. Grow as ground cover in shade or beneath open shrubs and trees. Will self-seed into gravel or cracks between paving. Great at the front of borders, as edging for paths or massed as a ground cover. A clump-forming perennial forming dense, leafy mounds of light green leaves.

dwatta None Known. Although widely planted in herb gardens A. mollis has no medicinal properties. The species *Alchemilla xanthochlora* and *Alchemilla alpina* are recommended.

propta Seed - sow spring in a cold frame. The seed usually germinates in 3 - 4 weeks at 16c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on a cold frame for their first winter, planting out in late spring or early summer. Division in spring or autumn. The divisions can be planted out direct into their permanent positions, though we find it best to pot them up and keep them in a sheltered position until they are growing away well.

nwatta An low growing herbaceous perennial plant making an excellent ground cover that grows in a clumping manner. Moist but well-drained soil in sun to partial

shade. Sun exposure: Full sun, dappled shade, partial shade. Shade type: Damp. Hardiness: Hardy. Soil type: Well drained,blight, sandy, clay, heavy, moist. Soil pH:5.5 to 7.5. Hardiness Zones:3 to 8. The plant tolerates close to full shade. The Royal Horticultural Society has given it its prestigious Award of Garden Merit (AGM). Dies down completely in winter.

## 4.2.389 *Delphinium menziesii*

Menzies' Larkspur

3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat m hkuc htut cyuti tu cp hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta *Delphinium menziesii* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Dye ParasiticideA parasiticide is obtained from the leaves[172]. It is quite toxic and so is for external use only. A blue dye can be obtained from the flowers[257].

dwatta Parasiticide PoulticeA poultice of the stalks and roots has been applied to sores[257].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°C[200]. Temperatures above 15°C inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Prefers a rich well-drained soil[111, 200]. Dislikes water-logged soils[200]. Requires an open sunny position[188]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 4.2.390 *Fritillaria meleagris*

Snakehead Fritillary, Chequered lily, Checkerred Fritillary

3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyuti tu cp hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyfxre7t hjonli

drutta *Fritillaria meleagris* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta The plant formerly had a reputation as a healing herb, but is not used at present[4].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. It is closely related to *S. caerulea*[71]. The following notes are based on the general needs of the genus. Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Plants in this genus are notably resistant to honey fungus[200].

## 4.2.242 *Calochortus tolmiei*

Tolmie Startulip

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyuti kyuctup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta *Calochortus tolmiei* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[105, 161, 177]. A sweet flavour; it can be baked or boiled like potatoes[257].

tcanta None known  
dwatta None known

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry over winter[1, 200]. Another report says that it is best grown in a good, very gritty soil in sun or semi-shade in a bulb frame[90]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1, 200]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that they should be replanted immediately[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1].

## 4.2.243 *Lilium cernuum*

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyuti tu cp hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta *Lilium cernuum* is a BULB growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is

hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[105, 177]. The bulb is up to 4cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known  
dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Lime tolerant[200]. Stem rooting, the bulbs should be planted 10 - 12cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Closely allied to *L. pumilum*[143]. The plants are short lived in cultivation. The plant is well suited to growing at the foot of a rock garden[143]. The flowers are sweetly scented[245]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 4.2.244 *Calochortus macrocarpus*

Sagebrush Mariposa Lily, Nez Perce mariposa lily

3 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat m hkuc htut cyuti kyuctup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta *Calochortus macrocarpus* is a BULB growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb - raw or cooked[105, 161, 177, 257]. The bulb can be harvested in early spring, peeled and eaten raw[257]. It can also be boiled or baked and used like potatoes[257]. Flower buds - raw[257]. A sweet flavour[257].

tcanta None known  
dwatta SkinA poultice of the mashed bulbs has been used to treat poison ivy rash[257].

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One

report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry over winter[1, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Bulbs frequently divide after flowering, the bulb-lets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1].

## 4.2.245 Calochortus gunnisonii

Mariposa Lily, Gunnison's mariposa lily  
3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli krcutcup hwicli hrasljut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Calochortus gunnisonii is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Bulb - raw or cooked[46, 105, 161]. One report says that the raw bulb tastes like a raw new potato[183]. It has a crisp nut-like texture and a pleasant flavour when cooked[85, 183]. The bulb can be dried and ground into a powder for making a sweet porridge, mush etc[85, 183, 257]. Leaves - cooked. It is hard to obtain a sufficient quantity[85] and use of the leaves will weaken the bulbs. Seed - ground into a powder[85, 183]. Flower buds - raw. Added to salads[85, 183].

tcanta MiscellanyNone known

dwatta Antirheumatic MiscellanyAn infusion of the plant has been taken internally to treat rheumatic swellings and to ease the delivery of the placenta[257].

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. The bulbs can be planted straight out into their permanent positions but in areas with wet winters it might be best to store them overwinter and replant them in the spring. Stem bulbils, harvested from the stems after flowering. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry from mid summer to late autumn[1, 60, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1, 42]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in the spring[138]. The bulbs must be replanted immediately according to another report[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. This species is closely related to *C. ambiguus*[214]. Hand pollination is necessary if seed is required[1].

## 4.2.246 Plantago major

Common Plantain, Cart Track Plant,White Man's Foot,Plantain

3 tin 12 cyuc 2 kcaak 3 tcan 3 dwat m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli fyfxre7t hjonli

drutta Plantago major is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Leaves Root SeedEdible Uses: TeaYoung leaves - raw or cooked[2, 5, 12, 56, 62, 183]. They are rather bitter and tedious to prepare because the fibrous strands need to be removed before use[9]. It is best not to use the leaf-stalk since this is even more fibrous than the leaf[183]. Many people blanch the leaves in boiling water before using them in salads in order to make them more tender[183]. A Chinese form has more palatable leaves - it contains about 2.7% protein, 0.4% fat, 2.2% ash[179]. Seed - raw or cooked[62, 172]. Very tedious to harvest[172]. The seed can be ground into a meal and mixed with flour[183]. It is very rich in vitamin B1[179]. The whole seeds can be boiled and used like sago[193]. The dried leaves make an acceptable tea[183]. Root[183]. No further details.

tcanta Some named forms have been selected for their ornamental value[233]. An important food plant for the caterpillars of many species of butterflies[30]. Special Features: Edible, Naturalizing, Suitable for dried flowers. Dynamic accumulator.

dwatta Antidote Astringent Demulcent Deobstruent Depurative Diuretic Expectorant Haemostatic Laxative Ophthalmic Poultice Refrigerant VermifugeCommon plantain is a safe and effective treatment for bleeding, it quickly staunches blood flow and encourages the repair of damaged tissue[254]. The leaves are astringent, demulcent, deobstruent, depurative, diuretic, expectorant, haemostatic and refrigerant[4, 7, 9, 21, 147, 165, 172, 238]. Internally, they are used in the treatment of a wide range of complaints including diarrhoea, gastritis, peptic ulcers, irritable bowel syndrome, haemorrhage, haemorrhoids, cystitis, bronchitis, catarrh, sinusitis, asthma and hay fever[238, 254]. They are used externally in treating skin inflammations, malignant ulcers, cuts, stings etc[4]. The heated leaves are used as a wet dressing for wounds, swellings etc[213, 222]. The root is a remedy for the bite of rattlesnakes, it is used in equal portions with *Marrubium vulgare*[207]. The seeds are used in the treatment of parasitic worms[213]. Plantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238]. A distilled water made from the plant makes an excellent eye lotion[7].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200]. Although this species is a common garden weed, some named forms have been selected for their ornamental value[233].

## 4.2.247 Vaccinium scoparium

Grouseberry, Grouse whortleberry

3 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 0.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium scoparium is a deciduous Shrub growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium

in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Analgesic Ophthalmic Tonic VulneraryThe leaves have analgesic properties and were used as a poultice on bruised shins and other sores and wounds[207, 222, 257]. A tea made from the whole plant was used to treat epileptic fits in babies[222, 257]. A decoction of the whole plant has been used as eye drops to treat sore eyes, sties and inflamed eyelids[257]. A tea made from the leaves was used as a gargle for sore throats and cankers in the mouth[222, 257]. A tea made from the roots is tonic[222].

propta Seed - the only information we have on this species is that it is difficult from seed and germinates infrequently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Pot up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary micorrhiza. Division with great care in the spring[1, 111]. Pot up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. Requires a peaty or leafy acid soil that remains moist in the summer[200]. The flowers have a delicate sweet perfume[245]. This is a very difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1]. This species is extremely rare and endangered in the wild[200].

## 4.2.385 Echinops ritro

Globe Thistle, Southern globethistle, Small Globe Thistle

3 tin 10 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc  
htut cyutli hgatkycutcup hwicli hyishrasljutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Echinops ritro is a PERENNIAL growing to 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known

tcanta None known

dwatta Antiinflammatory GalactogogueThe root is anti-inflammatory and galactogogue[176]. It is used in the treatment of breast abscesses with inflammation, mastitis, lack of milk in nursing mothers and distension of the breast[176].

propta Seed - sow early spring in a cold frame[111]. The seed usually germinates in 3 - 9 weeks at 25°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in an outdoor seedbed in mid spring and is then planted out into its permanent position in late summer or the autumn[111]. Division in autumn[111]. Root cuttings in the winter[200].

nwatta Landscape Uses:Border, Container, Erosion control, Ground cover, Massing, Seashore, Specimen. Succeeds in a sunny position in any well drained soil of low or medium fertility[200]. Established plants are drought tolerant[190]. There are a number of named varieties, selected for their ornamental value[200]. The flowers are often used for dried

flower displays[200]. If all the flowers are removed early in the season, the plant will often produce a second flush of bloom later in the summer[200]. Special Features: Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above, Attractive flowers or blooms.

## 4.2.386 Packera obovata

Roundleaf ragwort

3 tin 8 cyuc 0 kcaak 2 tcan 0 dwat 0.6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Packera obovata is an evergreen Perennial growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None Known

tcanta An effective, evergreen ground cover. Erosion control. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. Valued for its ability to thrive in shady locations, naturalize rapidly and produce a long and profuse spring bloom of bright yellow flowers [368-1]. Suitable locations include wild gardens, cottage gardens, native plant gardens (US), borders, or along streams/ponds.

dwatta None known

propta Seed will germinate within 4 weeks if sown at 20°C/70°F. Seed requires light to germinate. Root division during winter dormancy.

nwatta Moist, well-drained soils in full sun to part shade. Blooms well in shady locations. Tolerates some soil dryness [368-1]. Bloom Notes: Blooms February to April in southerly regions, April to June in the north. Bloom Description: Yellow. Naturalize rapidly and produce a long and profuse spring bloom of bright yellow flowers [368-1]. Like many species of ragwort, the plant is toxic to many herbivorous mammals, but sheep seem more tolerant of it than are most other grazing animals. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 4.2.387 Dryopteris marginalis

Marginal Woodfern, Leather Wood Fern

3 tin 8 cyuc 0 kcaak 0 tcan 4 dwat m hkuc  
hmim cyutli hgatkycutcup hwicli hrasljutnyik hpa7tli flatprk hpa7tmwatli hjonli

drutta Dryopteris marginalis is an evergreen Fern growing to 0.8 m (2ft 7in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcaakta None known

tcanta None known

dwatta Antirheumatic Odontalgic VermifugeThe root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent[171, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. An infusion of



and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.381 Delphinium nudicaule

Red Larkspur, Larkspur  
3 tin 7 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Delphinium nudicaule is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known

tcanta A blue dye is obtained from the flowers[207]. An ink can be made from the dye[207]. A parasiticide is obtained from the leaves[172]. It is quite toxic and so is for external use only.

dwatta NarcoticThe root is considered by some native North American Indians to be highly narcotic[213, 257].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°c[200]. Temperatures above 15°c inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°c[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden, Seashore, Specimen. Prefers a rich well-drained soil[111, 200]. Dislikes water-logged soils[200]. Requires an open sunny position[188]. Plants can flower in their first year from spring-sown seed, they are reliably perennial in their native environment, but often die overwinter in most parts of Britain[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Slugs and snails are very attracted to this plant[200]. Special Features: Attracts birds, Attractive foliage, North American native, All or parts of this plant are poisonous, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above.

## 4.2.382 Woodwardia virginica

Virginia Chain Fern  
3 tin 10 cyuc 0 kcaak 3 tcan 0 dwat 0.4 m hkuc  
hmim cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Woodwardia virginica is a deciduous Fern growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcaakta None Known

tcanta Groundcover. A good high density groundcover that will work in a wet and shady spot. Garden Uses: Shade gardens, native plant gardens, woodland gardens or naturalized areas. Also effective along streams and ponds [368-1]. Provides shelter for frogs, toads, newts.

dwatta None known

propta Propagate by spores or rhizome division.

nwatta A deciduous, perennial, colony-forming, waxy green, deciduous fern. Prefers organically rich, medium to wet, well-drained soils in part shade to full shade. Does well in average garden soils and will take considerable sun as long as soils are kept consistently moist[368-1]. Soil pH: Acidic (pH<6.8). Typically occurs in woodland swamps and

bogs. Bloom Time: Non-flowering. Bloom Description: Non-flowering. Can be mistaken for Osmundastrum cinnamomeum (Cinnamon Fern). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.383 Centaurea montana

Mountain Cornflower, Perennial cornflower, Mountain Bluet  
3 tin 9 cyuc 0 kcaak 0 tcan 2 dwat m hkuc  
htut cyutli hgatkuyctup hwicli hyishrsajlutnyik hpa7tli flatprikliwslip hpa7tmwatli fyifxre7t hjonli

drutta Centaurea montana is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known

tcanta Can be used as a ground cover plant in a sunny position[188, 208].

dwatta Antitussive Astringent Diuretic Emmenagogue Ophthalmic Purgative TonicMountain cornflower is seldom used in modern herbalism, though it does still have a reputation in parts of Europe as a wash for tired eyes[268]. It is considered to be most effective on blue eyes, great plantain (*Plantago majus*) being used for brown eyes[268]. The dried flowers are antitussive, astringent, weakly diuretic, emmenagogue, ophthalmic, very mildly purgative and tonic[9]. An infusion can be used as a treatment for dropsy, constipation, as a mouthwash for bleeding gums and as an eye bath for conjunctivitis[9].

propta Seed - sow March in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. The seed is best sown as soon as it is ripe in August in a greenhouse, overwintered under cover, and planted out in spring. Division in autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. This should be done at least once every three years in order to maintain the plants vigour. Basal cuttings in spring. Harvest the shoots when they are about 5 - 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Container, Massing, Specimen. Succeeds in ordinary garden soil[1, 200]. Prefers a moist well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. Plants are hardy to at least -20°c[187]. A very ornamental plant[1], there are some named varieties[187]. The plants have creeping rhizomes and form spreading patches[187]. A good bee plant[108]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Invasive, Naturalizing, Suitable for cut flowers.

## 4.2.384 Pyrola elliptica

Waxflower Shinleaf

3 tin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.2 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli fyifxre7t hjonli

drutta Pyrola elliptica is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year;

(loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked and used in pies, jellies, jams, breads, muffins etc[60, 85, 161, 183, 257]. The dried fruits can be used to flavour other foods or to thicken soups[183]. The fruit is about 4 - 6mm in diameter[200]. The fresh or dried leaves can be used to make a kind of tea.

tcanta BroomThe branches can be used as brooms[257].

dwatta Antiemetic Antiseptic Appetizer Astringent Carminative HypoglycaemicAntiseptic, astringent, carminative, hypoglycaemic[172]. An infusion of the dried, pulverized leaves has been used in the treatment of nausea and to increase the appetite[257]. The dried and powdered fruits have been given to children to improve their appetite[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6. plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

## 4.2.248 Aquilegia formosa

Western Columbine

3 tin 7 cyuc 2 kcaak 0 tcan 2 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aquilegia formosa is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172, 213], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K]. Children enjoy sucking out the sweet nectar from the base of the flowers[257]. Early spring greens cooked and eaten as a vegetable[257]. Some caution is advised, see the notes above on toxicity. Root - cooked. Used by the N. American Indians as a famine food[213]. Some caution is advised, see the notes above on toxicity.

tcanta Hair Parasiticide ParasiticideThe seed is used to rid the hair of lice[172, 257]. The whole plant is boiled up and used as a hair wash[213, 257]. The seeds are aromatic. They can be crushed and rubbed on the body as a perfume or placed in a sachet and stored with clothes to impart a nice smell[257].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveWestern columbine was quite frequently employed by a number of native North American Indian tribes who used it to treat a variety of complaints[257]. It is little used in modern herbalism. Antispasmodic, diaphoretic, parasiticide, resolvent, salve[172]. A decoction of the root is used in the treatment of diarrhoea and stomach aches[257].

A decoction of the roots and leaves is used in the treatment of VD, dizziness and biliousness[257]. The mashed fresh roots can be rubbed briskly on aching rheumatic joints[257]. A poultice of chewed roots or leaves is applied to bee stings, sores etc[257]. A decoction of the leaves is used in the treatment of sore throats, coughs and colds[257]. The seeds can be chewed as a remedy for stomach aches[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sheltered sunny position[1] or partial shade[187]. Intolerant of heavy clay[200]. A very ornamental plant, it is hardy to about -15°c[187]. A short-lived species, often dying out after 2 - 3 years, though it usually produces seed prolifically[200, 233]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. This species is closely related to *A. canadensis*[200] and *A. flavescens*[60], often hybridizing with *A. flavescens* in the wild where their ranges overlap[270]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 4.2.249 Artemisia frigida

Fringed Wormwood, Prairie sagewort

3 tin 10 cyuc 2 kcaak 3 tcan 2 dwat 0.3 m hkuc  
htut cyutli hgatkuyctup hwicli hyishrsajlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Artemisia frigida is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: CondimentThe leaves are used by the Hopi Indians as a flavouring for sweet corn[61, 172, 177, 183, 257].

tcanta Deodorant Disinfectant Dye Essential Repellent- Both the growing and the dried plant can be used as an insect repellent[172]. The leaves can be placed on a camp fire to repel mosquitoes[257]. The aromatic leaves have been used in pillows etc as a deodorant[257]. Bunches of the soft leaves have been used as towels, toilet paper etc[257]. A green dye is obtained from the leaves[257]. Cultivated for its foliage effects, and has gained the Royal Horticultural Society's Award of Garden Merit. Used in landscaping and for erosion control and revegetation of rangeland. It is drought-resistant. Provides shelter for beneficial invertebrates: insects and other arthropods. A specialist nectary plant [1-2]. Groundcover [1-2].

dwatta Antispasmodic Deodorant Disinfectant Poultice Stimulant Stomachic Vermifuge Women's complaintsThe leaves are stomachic, vermifuge and used in the treatment of women's complaints[172]. The plant contains camphor, which is stimulant and antispasmodic[213]. An infusion of the leaves is used in the treatment of biliousness, indigestion, coughs and colds whilst the leaves are chewed and the juice swallowed to treat heartburn[257]. A poultice of the chewed leaves is used as a poultice to reduce swellings and the leaves are also placed in the nose to stop nosebleeds[257]. A hot poultice of the leaves has been used to treat toothache[257]. The leaves can be used as a sanitary towel to help reduce skin irritation[257]. They are also drunk as a tea when the woman is menstruating or to treat irregular menstruation[257]. The dried leaves are burnt in a room as a disinfectant[257]. A decoction of the root is used as a stimulant and tonic[257].

propta Seed - surface sow from late winter to early summer in a greenhouse in a very free-draining soil, but make sure that the compost does not dry out. The seed usually germinates within 1 - 2 weeks in a warm greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first

winter. Plant them out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame. Division in spring or autumn[200].

nwatta Requires a sunny position and a well-drained soil that is not too rich[1, 200]. Requires a lime-free soil. Established plants are very drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. A very ornamental plant[1]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 4.2.250 Podophyllum peltatum

American Mandrake, Mayapple, Ground Lemon, Mandrake, Mayapple

3 tlin 9 cyuc 2 kcaak 2 tcan 4 dwat 0.3 m hkuc  
hmicm cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli dyatre7t hjonli

drutta Podophyllum peltatum is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from April to October, in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw, cooked or made into jams, jellies, marmalades, pies etc[1, 2, 4, 43, 101, 183]. The fruit can also be dried for later use[257]. The fruit should only be eaten when it is fully ripe[55, 62, 95], the unripe fruit is strongly laxative[183]. Remove the rind[95]. The fruit is very aromatic[95], and has a peculiar though agreeable flavour[183]. Sweet and acid. Do not eat the seeds[62]. In excess the fruit can cause colic[22, 65, 159]. The fruit is about 5cm long[200].

tcanta InsecticideAn infusion of the boiled leaves has been sprayed on potato plants to protect them from insects[213]. Other reports suggest that it is insecticidal rather than repellent[238, 257]. The root ooze has been used to soak corn seed prior to planting it out in order to prevent it being eaten by crows or insects[257].

dwatta Antibilious Cancer Cathartic Cytostatic Homeopathy Hydrogogue Purgative Warts Women's complaintsAmerican mandrake is a most powerful and useful herbal medicine, exercising an influence on every part of the system and stimulating the glands to healthy action[4]. Its greatest power lies in its action on the liver and bowels[4]. It is a gastro-intestinal irritant, a powerful hepatic and intestinal stimulant[4]. Although often used internally in the past, the plant's cytotoxic action makes it an unsafe remedy for internal use[254]. The root is antibilious, cathartic, cytostatic, hydrogogue and purgative[4, 19, 46, 57, 64, 124, 222]. The plant contains podophyllin, which has an antimiotic effect (it interferes with cell division and can thus prevent the growth of cells). It is, therefore, a possible treatment for cancer, and has been used especially in the treatment of ovarian cancer[46, 51, 57, 64, 65, 124, 244]. However, alopecia is said to be a common side-effect of this treatment[244]. The root is most active medicinally in early spring when it is beginning to shoot[4]. The resin, which is obtained from the root[207], is used in the treatment of warts and has been found to be effective against uterine warts that are sometimes experienced in pregnancy[200, 222]. It is also used in the treatment of small-cell carcinoma[207]. The root is harvested in the autumn and either dried for later use or the resin is extracted[238]. The whole plant, apart from the ripe fruit, is highly poisonous and should only be used under the supervision of a qualified practitioner[238]. It should not be prescribed for pregnant women[238]. Large doses have been used to commit suicide[213]. A homeopathic remedy is obtained from the fresh root, harvested before the fruit is ripe[232]. This is used particularly in the treatment of diarrhoea[232].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in a cold frame in early spring. The seed germinates in 1 - 4 months at 15°C. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least 2 growing seasons. Plant them out into their permanent positions in the winter when the plants are dormant. Division in March/April[111].

nwatta Landscape Uses:Ground cover, Woodland garden. Prefers a moist peaty soil and filtered light or shade[4, 111]. Grows well in a moist open woodland[28, 31] and also succeeds under beech trees in a deep moist leafy soil[130]. Succeeds in a pH ranging from 4 to 7[238]. A very hardy plant[4], tolerating temperatures down to -15°C or lower when dormant[187], though the young leaves in spring can be damaged by late frosts[233]. Plants in this genus have excited quite a lot of interest for the compounds found in their roots which have been shown to have anti-cancer activity[124]. There are various research projects under way (as of 1990)[124]. The flower has a foul smell[232]. The plant takes some years to become established[124] but is very long lived in a suitable habitat[130] and can become a vigorous colonizer[233]. Special Features: North American native, Naturalizing. The plant is heat tolerant in zones 8 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.251 Calochortus nuttallii

Sego Lily

3 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Calochortus nuttallii is a BULB growing to 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Bulb - raw or cooked[207]. Remove the outer husk. Excellent raw, the flavour is greatly improved by slow cooking[183]. The bulbs are said to have a crisp nut-like texture and a pleasant flavour when cooked. The bulbs can also be dried and ground into a powder[207] which can be used with cereal flours when making bread[212]. Leaves - cooked as a potherb[183]. It is hard to obtain a sufficient quantity and this use of the leaves will weaken the plants so is not to be recommended[K]. Seed - ground into a powder[183]. Flowers and flower buds - raw. A tasty addition to the salad bowl[183].

tcanta None known  
dwatta None known

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will

when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Landscape Uses:Border, Erosion control, Massing, Seashore, Specimen, Woodland garden. Succeeds in ordinary garden soil that is well-drained but moisture retentive in sun or part shade[200]. This species is hardy to about -25°C[187]. Plants seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers.

### 4.2.378 Primula auricula

3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Primula auricula is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta When growing in the right conditions this species and its cultivars make a good ground cover[208]. They are best spaced about 30cm apart each way[208].

dwatta AntitussiveThe leaves are used as a remedy for coughs[4]. Used in the treatment of headaches[61].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in early spring in a cold frame. Germination is inhibited by temperatures above 20°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in autumn.

nwatta Prefers a freely-draining moderately fertile humus-rich sandy loam[200]. Prefers an alkaline soil[188]. Grows well in heavy clay soils[208]. Dislikes dry soils[200]. Requires some shelter from the summer sun[1, 200]. Grows well in the shade of a north wall but does not like growing under trees[208]. A very ornamental and polymorphic species[1]. The flowers are sweetly honey-scented[245].

### 4.2.379 Actaea pachypoda

White Baneberry

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.8 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Actaea pachypoda is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antipiruritic Antirheumatic Emmenagogue Galactagogue Hypnotic Oxytotic Stimulant VDThe whole plant, but especially the root, is anticonvulsive, antirheumatic, emmenagogue, mildly hypnotic, oxytotic and stimulant[207, 257]. Use with caution, see the notes above on toxicity[222]. A decoction of the roots has been used in the treatment of coughs, colds, rheumatism and syphilis[213, 257]. It is also used in small doses to ease the pain of childbirth[222] and is used as a stimulant to revive and rally patients at the point of death[257]. An infusion of the roots has been used externally to treat itchy skin and as a gargle for sore throats[257]. An infusion of leaves was drunk by the

women of some Indian tribes in order to stimulate the flow of milk[213].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame or in a sheltered outdoor bed[200]. Completely remove the seed pulp since this can inhibit germination. Stored seed does not usually germinate well[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in late spring or early summer of the following year. Division in spring.

nwatta Tolerates most conditions[233], but prefers a humus-rich moist soil in light shade[200, 233]. Grows best in the wild or woodland garden[200]. This species is closely related to *A. rubra*[200].

### 4.2.380 Geranium maculatum

Spotted Cranesbill, Spotted geranium, Crowfoot, Wild Geranium, Cranesbill

3 tlin 10 cyuc 0 kcaak 2 tcan 3 dwat m hkuc  
htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Geranium maculatum is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Dye Miscellany TanninA brown dye is obtained from the flowers[168]. The roots and the leaves are rich in tannin[4]. Plants are suitable for ground cover when spaced about 45cm apart each way[208].

dwatta Antidiarrhoeal Antisepctic Astringent Cholera Diuretic Dysentery Kidney Miscellany Styptic TonicThe whole plant, but especially the root, is antiseptic, highly astringent, diuretic, styptic and tonic[4, 21, 102, 165, 222, 238]. An infusion of the whole plant, or of the roots alone, is used in the treatment of diarrhoea (especially in children and the elderly), dysentery, irritable bowel syndrome, cholera, kidney complaints, bleeding and a wide range of other ailments[61, 213, 254]. It is often used in combination with other herbs[238]. Externally, it is applied to purulent wounds, haemorrhoids, thrush, vaginal discharges and inflammations of the mouth[238]. The plants are rich in tannin[213], the root containing 10 - 20%[222]. The roots can be harvested in the autumn then dried and stored[213]. It is best to harvest the roots as the plant comes into flower since it is then at its most active medicinally[4]. The leaves are harvested as the plant comes into flower and are dried for later use[238].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Massing, Woodland garden. Succeeds in only moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200], including water-logged soils[187]. Plants are hardy to about -25°C[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit

dwatta Cardiac Stimulant TonicThe leaves are cardiac, stimulant and tonic[46, 61]. They are often used in the treatment of certain heart complaints.

propta Seed - surface sow early spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 20°c[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Landscape Uses: Border, Specimen. An easily grown plant, succeeding in ordinary garden soil, especially if it is rich in organic matter[1]. It also succeeds in dry soils and, once established, is drought tolerant[188, 190]. It prefers semi-shade but succeeds in full sun if the soil is moist[188, 200]. Plants are hardy to about -20°c[187]. A short-lived perennial or biennial[187]. Members of this genus are rarely if ever troubled by browsing deer and rabbits[233]. Special Features: Not North American native, All or parts of this plant are poisonous, Suitable for cut flowers, Attractive flowers or blooms.

## 4.2.375 Rhododendron maximum

Rosebay Rhododendron, Great laurel  
3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhyut ci tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Rhododendron maximum is an evergreen Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta WoodWood - fine-grained, hard, heavy, strong, rather brittle[46, 61, 82, 229]. It weighs 39lb per cubic foot[235]. Used for tool handles and as a boxwood (*Buxus* spp.) substitute in engraving[46, 61, 82, 229].

dwatta Analgesic Antirheumatic CardiacThe poulticed leaves are used to relieve arthritic pain, headaches etc[61, 222]. A decoction of the leaves is occasionally employed internally in domestic practice in the treatment of rheumatism[82, 257]. The leaves are taken internally in controlled dosage for the treatment of heart ailments[222]. Caution is advised, see the notes above on toxicity.

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. Hardy to about -30°c[184]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 4.2.376 Lycopodium complanatum

Ground Pine, Groundcedar  
3 tlin 7 cyuc 0 kcaak 0 tcan 3 dwat 0.1 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlut hpa7tli flatprklwls hpa7tmwatli hjonli

drutta Lycopodium complanatum is an evergreen Fern growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy) and

medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta Miscellany Mordant WeavingThe plant can be used as a mordant in dyeing[172, 257]. The following uses are for *L. clavatum*. They quite possibly also apply to this species[K]. The spores are water repellent and can be used as a dusting powder to stop things sticking together[106, 171]. They are also used as a talcum powder and for dressing moulds in iron foundries[74]. They can also be used as explosives in fireworks and for artificial lightning[46, 57, 102, 171, 213]. The stems are made into matting[46].

dwatta Analgesic Miscellany Tonic UrinaryA decoction of the plant is analgesic, antirheumatic, carminative, mildly diuretic, stomachic and tonic[4, 218, 238]. It is used internally in the treatment of urinary and kidney disorders, catarrhal cystitis, gastritis etc[238]. It is applied externally to skin diseases and irritations[238]. The plant can be harvested all year round and is used fresh or dried[238]. The spores of this plant are antipruritic, decongestant, diuretic and stomachic[4]. They are applied externally as a dusting powder to various skin diseases, to wounds or inhaled to stop bleeding noses[4, 7]. They can also be used to absorb fluids from injured tissues[213, 218]. The spores are harvested when ripe in late summer[9]. The spores can also be used as a dusting powder to prevent pills sticking together[4, 213]. A homeopathic remedy is made from the spores[232]. It has a wide range of applications including dry coughs, mumps and rheumatic pains[232, 238].

propta Spores - best sown as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. The spores are generally produced in abundance but are difficult to grow successfully[200]. Layering of growing tips[200].

nwatta Thrives in a rough spongy peat in a shady position[1]. Requires a humid atmosphere[200]. Terrestrial members of this genus are hard to establish. The roots are delicate and liable to rot, most water being absorbed through the foliage[200]. The plant has an aromatic resinous smell[4]. Members of this genus are rarely if ever troubled by browsing deer[233]. Although looking more like a moss, this genus is closely related to the ferns[200].

## 4.2.377 Eupatorium maculatum

Joe Pye Weed, Spotted joe pye weed  
3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc  
hmimhyut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwls hpa7tmwatli fyifxre7t hjonli

drutta Eupatorium maculatum is a PERENNIAL growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta StrawThe stems have been used as straws[257].  
dwatta Antirheumatic Diaphoretic Diuretic KidneyA tea made from the whole herb is diuretic[222]. It is used in the treatment of kidney complaints, painful urination, rheumatism etc[61, 222]. The leaves and stems are harvested in the summer before the flower buds open, and are dried for later use[238]. A tea made from the roots is used in the treatment of fevers, colds, kidney and liver complaints, rheumatism etc[222, 257]. It is said to have a tonic effect upon pregnant women[257] and is also said to induce sweating[222]. Externally, a decoction of the roots is used as a wash on rheumatic joints[257]. The roots are harvested in the autumn and dried for later use[238].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots

rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a warm sunny position and must be kept dry from mid summer to late autumn[1, 90, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[42, 90]. It is easiest to grow in a bulb frame[90] but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that the bulbs should be replanted immediately[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1]. A very ornamental plant[1], it is the state flower of Utah[85, 95].

## 4.2.252 Alchemilla alpina

Alpine Lady's Mantle, Mountain Lady's Mantle  
3 tlin 7 cyuc 2 kcaak 0 tcan 3 dwat 0.2 m hkuc  
hmimhyut cyutli kyuctcup hwicli hrasjlutnyikfrp hpa7tli flatprk hpa7tmwatli fyifxre7t hjonli

drutta Alchemilla alpina is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaThe following uses are for *A. vulgaris*. They quite probably also apply to this species[K]. Young leaves - raw or cooked[5, 7]. A dry, somewhat astringent flavour[K]. They can be mixed with the leaves of *Polygonum bistorta* and *Polygonum persicaria* then used in making a bitter herb pudding called 'Easter ledger' which is eaten during Lent[177, 183]. Root - cooked. An astringent taste[4]. The leaves are used commercially in the blending of tea[7].

tcanta None known  
dwatta Alternative Antirheumatic Astringent Diuretic Emmenagogue Febrifuge Sedative Styptic Tonic Vulnerary-Lady's mantle has a long history of herbal use, mainly as an external treatment for cuts and wounds, and internally in the treatment of diarrhoea and a number of women's ailments, especially menstrual problems[9, 244]. This plant, the alpine ladies mantle, has been shown to be more effective in its actions[238, 268]. The herb is alterative, antirheumatic, astringent, diuretic, emmenagogue, febrifuge, sedative, styptic, tonic and vulnerary[4, 7, 9, 21, 46, 165]. The leaves and flowering stems are best harvested as the plant comes into flower and can then be dried for later use[4]. The fresh root has similar and perhaps stronger properties to the leaves, but is less often used[4]. The plant is rich in tannin and so is an effective astringent and styptic, commonly used both internally and externally in the treatment of wounds[4]. It helps stop vaginal discharge and is also used as a treatment for excessive menstruation and to heal lesions after pregnancy[4, 244]. Prolonged use can ease the discomfort of the menopause and excessive menstruation[268]. The freshly pressed juice is used to help heal skin troubles such as acne and a weak decoction of the plant has been used in the treatment of conjunctivitis[244].

propta Seed - sow spring in a cold frame. The seed usually germinates in 3 - 4 weeks at 16°c[133]. When large enough to handle, prick the seedlings out into individual pots

and grow them on a cold frame for their first winter, planting out in late spring or early summer. Division in spring or autumn. The divisions can be planted out direct into their permanent positions, though we find it best to pot them up and keep them in a sheltered position until they are growing away well.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Rock garden. Easily grown in ordinary soil in sun or part shade[1, 233]. Prefers a well-drained acid soil[200, 238]. Grows well in heavy clay soils. Succeeds in dry shade[188]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features:Attractive foliage, Not North American native, Suitable for cut flowers, Inconspicuous flowers or blooms.

## 4.2.253 Pinus radiata

Monterey Pine  
3 tlin 11 cyuc 1 kcaak 3 tcan 2 dwat 65 m hkuc  
htut cyutli hgtakuyuctcup hwicli vyhshrasjlut hpa7tli flatprk hpa7tmwatli dyat hjonli

drutta *Pinus radiata* is an evergreen Tree growing to 65 m (213ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from February to March, and the seeds ripen from January to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: CondimentA vanilla flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Hedge Hedge Herbicide Shelterbelt Wood-Very tolerant of maritime exposure and salt-laden winds, it is also very fast growing. Increases in height of between 1 and 2.5 metres per year have been recorded even in exposed positions, it makes an excellent shelterbelt tree[11, 75]. A tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - tough and hard[229]. It is light, soft, brittle, close-grained and not strong according to another report[82]. It is widely grown for lumber in warm temperate zones[200] and has been used for flooring, finishes and fuel[229].

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°c can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have

a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional TimberLandscape Uses:Screen, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Very resistant to maritime exposure[75], the leaves can be badly burned by cold dry winds but this does not seem to affect growth[11]. Mature trees produce a broad heavy crown and are somewhat likely to be blown down in severe gales[200]. Trees are somewhat tender when young[11]. Any transplanting is best done when the plant is in active growth in the summer. Only small plants should be moved[200]. Extensively cultivated for timber in warm temperate zones, especially in New Zealand, it grows larger in cultivation than it does in the wild[200]. It is a very vigorous tree in S.W. England[11] where growth takes place almost all year round and annual height increases of 2.5 metres in young plants are not uncommon[185]. Outside the milder areas growth is less vigorous, taking place from June to September[185]. A short-lived tree in the wild, where it rarely lives longer than 100 years[81]. It is probably going to be long-lived in cultivation in Britain[185]. It often self-sows in Britain, though the seedlings are usually found in the shade of the tree and do not flourish there[185]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones are 8 - 17cm long[82], they remain closed on the tree for many years, only opening after the heat of a forest fire followed by rain[200]. Plants can produce new shoots from reasonably old wood so the lower branches can be cut back to produce a hedge-like effect[11]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms.

### 4.2.254 Pinus nigra

Austrian Pine, Black Pine

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 30 m hkuc htuc cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flat-prikwiisslip hpa7tmwatli dyat hjonli

drutta Pinus nigra is an evergreen Tree growing to 30 m (98ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: CondimentA vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide Plaster Shelterbelt WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. A very wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Trees have proved to be very resistant to maritime exposure on our Cornwall trial grounds[K]. Resin and turpentine are obtained from the wood, they are used in oint-

ments and plasters[46, 64, 171]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - non durable. Used for rough carpentry and furniture[100].

dwatta PlasterThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Firewood, Specimen. Succeeds on all soil types, including chalk[1, 11, 200]. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Requires a sunny position[11]. A very hardy tree, it is extensively planted for timber and shelter[50, 200], tolerating maritime exposure[11, 75]. Fast growing when young, it outgrows the Corsican pine (*P. nigra maritima*) for the first 5 or 6 years but is then rapidly overtaken by that species[185]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow beneath the tree[18]. Trees tend to be short-lived in cultivation[11]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 4.2.255 Populus nigra

Black Poplar, Lombardy poplar

3 tlin 9 cyuc 1 kcaak 4 tcan 3 dwat 30 m hkuc htuc cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Populus nigra is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in April, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay)

USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta InsecticideThe plant contains helenalin, a compound that has insecticidal properties, though it is also toxic to fish and worms[222].

dwatta Alterative Cancer Laxative SternutatoryThe dried nearly mature flower heads are used in a powdered form as a snuff to treat colds and headaches[207, 222, 257]. When made into a tea they are used in the treatment of intestinal worms[222]. The powdered leaves are sternutatory[222, 257]. An infusion of the leaves is laxative and alterative[207]. An infusion of the stems has been used as a wash in the treatment of fevers[257]. The plant contains helenalin, a compound that has shown significant anti-tumour activity[222].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed it might be worthwhile trying a sowing in mid to late spring in situ outdoors[111]. Cuttings of soft wood from the base of the plant, June/July in a frame. Basal cuttings in spring[200]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[111]. This needs to be done fairly regularly because the clumps soon become congested[233]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Seashore. Grows well in ordinary garden soil[1, 111], succeeding in most conditions other than boggy soils[233]. It prefers a fertile moisture retentive soil[200] in a sunny position[108, 111]. Dislikes dry soil[200]. Plants seem to be immune to the predations of rabbits[233]. A good bee and butterfly plant[30]. A very ornamental plant[1], some named forms have been selected for their ornamental value[187]. Special Features: North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands plant, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

### 4.2.372 Euphorbia esula

Leafy Spurge. Green spurge

3 tlin 9 cyuc 0 kcaak 4 tcan 0 dwat 1 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Euphorbia esula is a PERENNIAL growing to 1 m (3ft 3in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Euphorbia esula has nutrient value similar to alfalfa (*Medicago sativa* L.) and crested wheatgrass (*Agropyron cristatum* (L.) Gaertn.) and provides nutritious forage for sheep and goats. Potential as a whole-plant biomass as a locally grown fuel crop for home-heating purposes (Maxwell et al., 1985). A high protein feed stock for grazing sheep and goats (Fox et al., 1991; Sedivec et al., 1995). The high protein diet result in very high quality mohair in angora goats (Stoneberg, 1989). High in hydrocarbon latex - possibly a good col-hardy hydrocarbon species. Leafy spurge hay burns with 4x the energy of wheat straw [1-1]. Dynamic accumulation:

dwatta None known

propta It can grow from seed or from creeping roots. Reproduces readily like by seeds that have a high germination rate and may remain viable in the soil for at least eight years.

nwatta Experimental Crop Management: HayClimate: boreal to subtropical. Humidity: arid to humid. Prefers areas of full sunlight and dry soil but can tolerate a variety of habitats including temperatures as low as -45C (-49F). A deep-rooted perennial plant. Roots grow twice as fast in sandy soil as in clay soil. Roots in clay soil have greater branching than those in sandy soil. High levels of soil nitrogen can reduce the biomass of leafy spurge roots and lead to greater root concentrations near the top of the soil profile (U.S. Forest Service). Especially aggressive in semi-arid situations. Adapted to a wide range of conditions, from moist to dry with annual rainfalls as low as 180mm (7"). It grows as clusters with upright stems, 0.3 to 1m tall. Cultivation: experimental. Management: hay (Describes the non-destructive management systems that are used in cultivation) [1-1].

### 4.2.373 Androsace sarmentosa

Rock Jasmine

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.1 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli lwisslip hpa7tmwatli xre7t hjonli

drutta Androsace sarmentosa is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta Can be used as a low-growing ground cover[200]. dwatta ResolventThe entire plant is used in Tibetan medicine, it is said to have a bitter taste and a cooling and coarsening potency[241]. A resolutive, it dries up serous fluids[241]. It is used in the treatment of disorders from tumours, inflammations of fluids and other serous fluid disorders[241].

propta Seed - requires a period of cold stratification. Where possible, the seed is best sown as soon as it is ripe in a cold frame - all watering should be from the bottom of the pot[200]. The seed can take 2 years to germinate, prick out the seedlings into individual pots as soon as they are large enough to handle and grow on in a partially shaded cold frame[200]. Plant out in late spring or early summer. Division of runners in early summer. Pot them up into a sandy compost and grow them on until they are well-rooted before planting them into their permanent positions[200].

nwatta Requires a very well-drained light or sandy alkaline soil of low nutrient status and with the addition of limestone chippings if necessary[200]. Usually best in full sun, though in hot-summer areas it can be better if given some shade, especially from the hottest sun[200]. Grows well on dry stone walls, or as a low ground cover, and tolerates hot humid summers[200].

### 4.2.374 Digitalis grandiflora

Large Yellow Foxglove

3 tlin 10 cyuc 0 kcaak 0 tcan 2 dwat 0.9 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Digitalis grandiflora is an evergreen Perennial growing to 0.9 m (3ft) by 0.3 m (1ft in) at a medium rate. It is in leaf all year, in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta None known

measles, headache, gingivitis, stomatitis, prolapse of the rectum and uterus[176]. The root is harvested in the autumn and used fresh or dried[238]. Use with caution[176], see the notes above on toxicity.

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Only just cover the seed. It germinates in 1 - 12 months or even longer at 15°C[164]. The seed does not store well and soon loses its viability[200], stored seed may germinate better if given 6 - 8 weeks warm stratification at 15°C and then 8 weeks cold stratification[164]. Prick out the young seedlings into individual pots when they are large enough to handle and grow them on in a frame for their first winter. Plant out in late spring or early summer[K]. Division in spring or autumn[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist humus rich soil and some shade[1, 200]. Succeeds in ordinary garden soil[1]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 4.2.369 Lobelia cardinalis

Cardinal Flower

3 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 1 m hkuc  
hmmhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrp  
hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Lobelia cardinalis is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta None known  
tcanta None known

dwatta Analgesic Anthelmintic Antispasmodic Emetic Epilepsy Expectorant Febrifuge Homeopathy Nerve StomachicEmetic, expectorant and nerve[4, 61]. The root is analgesic, anthelmintic, antispasmodic and stomachic[4, 61, 257]. A tea made from the roots has been used in the treatment of epilepsy, syphilis, typhoid, stomach aches, cramps, worms etc[222, 257]. A poultice of the roots has been applied to sores that are hard to heal[257]. The leaves are analgesic and febrifuge[257]. A tea made from the leaves is used in the treatment of croup, nosebleeds, colds, fevers, headaches etc[222]. A poultice of the leaves has been applied to the head to relieve the pain of headaches[257]. This species is considered to have similar medicinal activity to *L. inflata*, but in a milder form[222]. It was seldom if ever used[222]. The plant is used to make a homeopathic remedy[4]. The report does not say which part of the plant is used, nor what it treats.

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200]. Basal cuttings in spring[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Layering in moist sand, it forms roots at the nodes[200].

nwatta Landscape Uses:Border, Container, Massing, Specimen, Woodland garden. Requires a deep rich soil and plenty of moisture[1, 200]. Grows well in heavy clay soils. Succeeds in standing water though is not then so long lived[200]. Succeeds in full sun or light shade[200]. Requires protection from the wind[200]. Dormant plants are hardy to at least -25°C[187], though they can be excited into premature growth in mild winter areas and are then more susceptible to frost damage[200]. A very ornamental plant[1]. Hybridizes freely with other members of this genus. Special Features:Attracts birds, North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands

plant, Attracts butterflies, Suitable for cut flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 4.2.370 Veronicastrum virginicum

Beaumont's Root, Culver's root, Bowman's Root, Culver's Root, Black Root

3 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 1.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis  
hpa7tmwatli fyifxre7t hjonli

drutta Veronicastrum virginicum is a PERENNIAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Cathartic Cholagogue Emetic Hepatic Laxative TonicBeaumont's root was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is still occasionally used in modern herbalism, mainly for its effect upon the liver and bile production. Some caution is advised, the plant is potentially toxic[222]. The root is anodyne, cathartic, emetic, hepatic, laxative and tonic[4, 46, 61, 165, 218, 222]. The fresh root is a violent cathartic and possibly emetic, the dried root is milder in its action, but less certain[4]. The root also gently excites the liver and increases the flow of bile[4, 238]. An infusion has been used in the treatment of diarrhoea, coughs, chills and fevers, and also to ease the pain of backaches[257]. A tea made from the roots is strongly laxative[213, 222]. The roots are harvested in the autumn and should be stored for at least a year before use[213].

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient quantity the seed can be sown outdoors in situ in the autumn or the spring. Division in autumn or spring[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Border, Massing, Seashore, Woodland garden. Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200]. Prefers a sunny position[188]. Hardy to at least -20°C[187]. Some named forms have been selected for their ornamental value[200]. Special Features:North American native, Attracts butterflies, Extended bloom season in Zones 9A and above.

### 4.2.371 Helenium autumnale

Sneezeweed, Common sneezeweed, Fall sneezeweed, Mountain sneezeweed, False Sunflower

3 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1.8 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta Helenium autumnale is a PERENNIAL growing to 1.8 m (6ft) by 0.5 m (1ft 8in) at a fast rate. See above for

soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner barkEdible Uses: Inner bark-dried, ground then added to flour and used for making bread etc[2]. A famine food, used when all else fails[177].

tcanta Cork Fodder Rooting hormone Shelterbelt WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. A fast growing tree, it is often used to provide a quick screen or wind-break[200]. The cultivar 'Italica' is commonly used for this purpose though it is not a very suitable choice because it has fragile branches and is prone to basal rot which can cause sudden collapse[200]. The cultivar 'Plantierensis' is much more suitable[200]. A resin obtained from the buds is made into a salve and used in home remedies[46]. The bark is used as a cork substitute for floats etc[115]. Wood - very soft, very light, rather woolly in texture, without smell or taste, of low flammability, not durable, easy to work, very resistant to abrasion. Used for lower quality purposes[11, 46, 61, 115, 227].

dwatta Alterative Anodyne Antiinflammatory Astringent Diaphoretic Diuretic Expectorant Febrifuge Salve Stimulant Tonic Urinary VulneryThe leaf buds are covered with a resinous sap that has a strong turpentine odour and a bitter taste[4, 213]. They also contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213]. The buds are antiscorbutic, antiseptic, balsamic, diaphoretic, diuretic, expectorant, febrifuge, salve, stimulant, tonic and vulnerary[4, 9, 21, 165, 238]. They are taken internally in the treatment of bronchitis and upper respiratory tract infections, stomach and kidney disorders[4, 238]. They should not be prescribed to patients who are sensitive to aspirin[238]. Externally, the buds are used to treat colds, sinusitis, arthritis, rheumatism, muscular pain and dry skin conditions[238]. They can be put in hot water and used as an inhalant to relieve congested nasal passages[213]. The buds are harvested in the spring before they open and are dried for later use[238]. The stem bark is anodyne, anti-inflammatory, antiseptic, astringent, diuretic and tonic[14, 46, 61, 178, 218]. The bark contains salicylates, from which the proprietary medicine aspirin is derived[238]. It is used internally in the treatment of rheumatism, arthritis, gout, lower back pains, urinary complaints, digestive and liver disorders, debility, anorexia, also to reduce fevers and relieve the pain of menstrual cramps[14, 46, 61, 178, 213, 238]. Externally, the bark is used to treat chilblains, haemorrhoids, infected wounds and sprains[238]. The bark is harvested from side branches or coppiced trees and dried for later use[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78]. This species rarely produces suckers[238].

nwatta Agroforestry Services: Living trellis Agroforestry Services: Windbreak Fodder: Bank Historic Crop Industrial Crop: Biomass Management: Coppice Management: Standard Other Systems: Irreg. Intercrop Other Systems: SRC Other Systems: Strip intercropA very easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circumneutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It is fairly wind tolerant, though it does not do well in exposed upland sites, or in maritime exposure[11, K]. It dislikes shade and is intolerant of root or branch competition[200]. A fast-growing tree, reaching maturity in

about 100 years and declining thereafter[186]. There are several named varieties that have been selected mainly for their ornamental value[11]. The leaf buds, as they swell in the spring, and the young leaves have a pleasing fragrance of balsam[245]. The fragrance is especially pronounced as the leaves unfold[245]. Very tolerant of hard pruning, the trees have often been pollarded in the past[186]. Plants seldom produce suckers[186]. An important food plant for the caterpillars of several species of butterfly[30]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 4.2.256 Populus angustifolia

Narrowleaf Cottonwood

3 tlin 7 cyuc 1 kcaak 2 tcan 2 dwat 30 m hkuc  
htut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprikklwis  
hpa7tmwatli nyanhjen hjonli

drutta Populus angustifolia is a deciduous Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 3. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Inner barkEdible Uses: Gum SweetenerInner bark[105, 161, 177] There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread. A 'honeysdew', produced on the undersides of leaves by aphids, was collected by various native North American Indian tribes and used as a sweetener[227]. The buds have been used as a chewing gum[257].

tcanta Basketry Gum Rooting hormone Soil stabilization WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. The young shoots are used in making baskets[227, 257]. The highly developed root system helps to reduce erosion when trees are planted on banks and slopes[226]. Wood - weak, soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11, 227]. It weighs 24lb per cubic foot[235]. The tree's scarcity and small size make it commercially unimportant, though it is sometimes used locally for fence posts and fuel[227, 229].

dwatta Analgesic Antiinflammatory Antiscorbutic Febrifuge OdontalgicA tea made from the inner bark is used in the treatment of scurvy[161]. The bark contains salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 226, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238]. The woody fruit is moistened and applied to the gums in order to treat infections[226]. A tea made from the fruits is used in the treatment of toothache[226].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their

permanent positions. Very easy. Suckers in early spring[78].

nwatta An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It does not do well in exposed upland sites[11]. Dislikes shade, it is intolerant of root or branch competition[200]. A fast-growing but short-lived species in the wild[229]. The young leaves and expanding buds emit a pleasant distinctive fragrance in the spring[226]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200].

## 4.2.257 Larix lyallii

Sub-Alpine Larch

3 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 25 m hkuc  
hminhtut cyutili tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Larix lyallii is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: The shoot-tips are used as a flavouring in soups[177].

tcanta Tannin WoodThe bark contains tannin[229]. Wood - strong, heavy, hard, coarse-grained and durable[82, 229].

dwatta None known

propta Seed - sow late winter in pots in a cold frame. One month cold stratification helps germination[113]. It is best to give the seedlings light shade for the first year[78]. As soon as they are large enough to handle, prick out the seedlings into individual pots. Although only a few centimetres tall, they can be planted out into their permanent positions in the summer providing you give them an effective weed-excluding mulch and preferably some winter protection for their first year. Otherwise grow them on in the cold frame for their first winter and plant them out in early summer of the following year. The seed remains viable for 3 years[113] If you are growing larger quantities of plants, you can sow the seed in an outdoor seedbed in late winter. Grow on the seedlings in the seedbed for a couple of years until they are ready to go into their permanent positions then plant them out during the winter.

nwatta Prefers an open airy position in a light or gravelly well-drained soil[200]. Intolerant of badly drained soils, but tolerates acid and infertile soils[200]. Succeeds on rocky hill or mountain sides and slopes[200]. A north or east aspect is more suitable than west or south[1]. This species is very cold-hardy when fully dormant, but the trees can be excited into premature growth in Britain by mild spells during the winter and they are then very subject to damage by late frosts and cold winds[1]. Plants are not very successful in Britain, they have been tried on many occasions but have failed to make a satisfactory tree[11, 185]. A specimen at the Hillier Arboretum was 4.5 metres tall in 1970 and suffered frost damage each year[185]. This species is impossible to grow in lowland Britain, though it should succeed above a height of 300 metres in the eastern Scottish Highlands[200]. Growth is normally slow in Britain with average height increases of less than 30cm per year[185]. Hybridizes freely with other members of this genus[200]. Closely related to *L. occidentalis*[200]. Open ground plants, 1 year x 1 year are the best for planting out, do not use container grown plants with spiralled roots[200]. Plants transplant well, even when coming into growth in the spring[200]. Plants in this genus are notably resistant to honey fungus[200].

## 4.2.258 Fraxinus pennsylvanica

Red Ash, Green ash, Water Ash

3 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 20 m hkuc  
htut cyutili tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Fraxinus pennsylvanica is a deciduous Tree growing to 20 m (65ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Inner barkEdible Uses: Inner bark - cooked[105, 161, 177]. The cambium layer can be scraped down in long, fluffy layers and cooked[257]. It is said to taste like eggs[257]. Inner bark can also be dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread.

tcanta Basketry Dye Shelterbelt WoodA fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. A red dye is extracted from the bark[226]. Logs of wood can be beaten with mauls to separate the growth layers, these layers can then be cut into strips and woven into baskets[257]. Wood - hard, heavy, rather strong, tough, elastic, brittle, coarse-grained. It weighs 44lb per cubic foot. Used for tool handles, furniture etc[61, 82, 149, 171, 235]. The wood is of poorer quality than *F. americana*, though it is usually sold under that name[226].

dwatta Bitter Diuretic TonicThe bark and leaves are a bitter tonic[4, 61]. An infusion of the inner bark has been used in the treatment of depression and fatigue[257]. The root is diuretic[4].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Landscape Uses:Aggressive surface roots possible, Pollard, Street tree. Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[11, 200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. A fast-growing tree[188]. Plants have little tolerance of shade[226]. Cultivated as a timber tree in C. and S.E. Europe where it is sometimes naturalized[50]. The cultivar 'Patmore' is disease resistant[188]. Dioecious. Male and female plants must be grown if seed is required. Special Features:North American native, Attracts butterflies, Inconspicuous flowers or blooms.

## 4.2.259 Populus alba

White Poplar

3 tin 9 cyuc 1 kcaak 3 tcan 2 dwat 20 m hkuc  
htut cyutili kyucutcp hwicli hrasjlutnyikrip hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Populus alba is a deciduous Tree growing to 20 m (65ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers

plant has a general stimulatory effect on the immune system and is widely used in modern herbal treatments[222]. There has been some doubt over the ability of the body to absorb the medicinally active ingredients orally (intravenous injections being considered the only effective way to administer the plant), but recent research has demonstrated significant absorption from orally administered applications[222]. In Germany over 200 pharmaceutical preparations are made from Echinacea[222]. The roots and the whole plant are considered particularly beneficial in the treatment of sores, wounds, burns etc, possessing cortisone-like and antibacterial activity[222]. The plant was used by North American Indians as a universal application to treat the bites and stings of all types of insects[213]. An infusion of the plant was also used to treat snakebites[213]. The root is adaptogen, alterative, antiseptic, depurative, digestive, sialagogue[4, 21, 61, 165]. It is harvested in the autumn and dried for later use[238]. The plant has been used as a diaphoretic[213]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Echinacea for common cold, cough and bronchitis, fevers and cold, urinary tract infections, inflammation of the mouth and pharynx, increase resistance to infection, wounds and burns (see [302] for critics of commission E).

propta Seed - sow March/April in a greenhouse and only just cover the seed[175, K]. Diurnal temperature fluctuations aid germination[175]. The seed usually germinates in 10 - 21 days at 25°C[175]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse for the first summer. Plant them out in the late spring or early summer of the following year and give them some protection from slugs at least until they are established[K]. Division in spring or autumn[111]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings, October in a frame[200].

nwatta Prefers a deep rich loam with plenty of leaf-mold[1] and a sunny position[175]. Closely related to *E. pallida* and included in that species by some botanists[274]. Slugs love this plant[K]. USDA Hardiness Zone: Zone 3-8. AHS Heat Zone: 9-1 In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 4.2.366 Aconitum carmichaelii

Japanese Aconite, Carmichael's monkshood

3 tin 7 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hminhtut cyutili tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aconitum carmichaelii is a PERENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Anaesthetic Analgesic Antiinflammatory Antirheumatic Cardiotonic VasodilatorA widely used herbal remedy in China, where it is cultivated for its root[218]. This is harvested in the autumn as the plant dies down and is then dried before being used. The root is anaesthetic, analgesic, anti-inflammatory, antirheumatic, cardiotonic, stimulant and vasodilator[176, 218, 238]. It is used in the treatment of shock and collapse, chronic diseases with symptoms of cold, gastralgia and rheumatic arthralgia, oedema and diarrhoea due to hypofunction of the spleen and kidney[176]. A tincture of the root is used externally in the treatment of rheumatism, arthralgias, sprains, contusions etc[283]. Use with great caution, the plant contains the toxic alkaloid aconitine and is very poisonous - should not be used internally[218] unless under the direction of a qualified practitioner[238, 283]. Overdoses lead to numbness of the tongue, lips and extremities,

nausea, vomiting, irritability and coma[176].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in moist soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Plants will only thrive in a sunny position if the soil remains moist throughout the growing season[238]. Prefers a calcareous soil. This species is not included in the Flora of North America[270] and so it should be considered doubtful that its range includes this region. A very ornamental plant[233], there are some named forms[238]. It grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. Closely related to *A. fischeri* and considered to be part of that species by some botanists[1].

## 4.2.367 Verbascum pulverulentum

Hoary Mullein, Broad-leaf mullein

3 tin 7 cyuc 0 kcaak 2 tcan 1 dwat 1.8 m hkuc  
htut cyutili kyucutcp hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli fyifxre7t hjonli

drutta Verbascum pulverulentum is a BIENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta None known  
tcanta Dynamic accumulator:  
dwatta VermifugeThe plant (seeds?) are used to rid the body of tapeworms[4].

propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta Succeeds in most well-drained soils, including dry ones, and prefers a sunny position[200]. Dislikes shade and wet soils[200]. Thrives on chalk[200]. Prefers a light soil[200]. Hybridizes with other members of this genus, though the progeny are usually sterile[200].

## 4.2.368 Cimicifuga heracleifolia

Komarov's Bugbane

3 tin 7 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc  
hmin cyutili tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cimicifuga heracleifolia is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Analgesic Antibacterial Antipyretic Antiviral SedativeThe root is analgesic, antibacterial, antiviral, febrifuge and sedative[176, 279]. It is used internally in the treatment of common cold with headache and sore throat,



dwatta Antiphlogistic FebrifugeThe plant is antiphlogistic and febrifuge[266].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. This species is closely related to *A. sacrorum* and *A. gmelinii*, it is often confused with those species[266]. We are not sure if this plant is annual, biennial or perennial, since various reports differ. Members of this genus are rarely if ever troubled by browsing deer[233].

#### 4.2.363 *Chelone glabra*

Balmony, White turtlehead

3 tin 7 cyuc 0 kcaak 0 tcan 3 dwat 1 m hkuc

hmimhtut cyutli tcuphja7n hwicli hrasjlutnykfrp hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Chelone glabra* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta None known

dwatta Antibilious Aperient Appetizer Cathartic Cholagogue Detergent Tonic VermifugeBalmony is a very bitter herb with a tea-like flavour that acts mainly as a tonic for the liver and digestive system[238]. It has long been held in esteem in N. American folk medicine, though it has never been investigated scientifically[268]. The herb also has anti-depressant and laxative effects[238]. A decoction of the whole herb is antibilious, aperient, appetizer, cathartic, cholagogue, detergent, tonic, vermifuge[4, 21, 46, 61, 165, 207, 222]. It is used internally in the treatment of consumption, debility, diseases of the liver, gallbladder problems, gallstones etc[4, 254]. It is also used to relieve nausea and vomiting, intestinal colic and to expel worms[254]. Its tonic effect upon the digestive system has made it of benefit in the treatment of anorexia nervosa[268]. Externally, it is applied as a soothing ointment to piles, inflamed tumours, irritable ulcers, inflamed breasts etc[4, 268]. The plant is harvested when in flower and is dried for later use[238].

propta Seed - sow spring in a cold frame and keep moist. The seed germinates in 2 - 6 weeks at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame. Plant them out into their permanent positions in the spring or early summer. Division in autumn[1]. Cuttings of soft tips in summer in a sandy soil in a frame[200].

nwatta Easily grown in any ordinary soil, but it grows best in a light loam[1]. Tolerates heavy clays and light shade[1, 200]. Prefers growing in light shade[238]. Survives but does not thrive in dry conditions[200]. Prefers growing in a bog garden or in a soil that is unlikely to dry out[200]. Plants are very cold-hardy, tolerating temperatures down to about -20°C[187]. A polymorphic species, there are several named forms[43]. The plant spreads freely at the roots and so is best grown in a large pot[4].

#### 4.2.364 *Solidago rigida*

Stiff Goldenrod, Flat Topped Goldenrod, Stiff Goldenrod

3 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 1.2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Solidago rigida* is a PERENNIAL growing to 1.2 m (4ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Dye LatexA good quality rubber can be made from a latex that is obtained from the leaves[46, 61]. Mustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta Antiseptic Astringent Cathartic Diuretic Stings StypticThe leaves and blossoms are antiseptic, astringent and styptic[4, 168]. A valuable remedy in the treatment of all kinds of haemorrhages[4]. The flowers have been ground into a lotion and used to treat bee stings[213, 257]. An oil obtained from the plant (is this an essential oil?) is diuretic[4]. The root is cathartic and diuretic[257]. A decoction of the root has been used as an enema[257]. An infusion has been used to restore the flow of urine[257].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border. Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238]. Special Features: Attractive foliage, North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

#### 4.2.365 *Echinacea angustifolia*

Echinacea, Blacksamson echinacea, Strigose blacksamson

3 tin 8 cyuc 0 kcaak 2 tcan 5 dwat 1.2 m hkuc

htut cyutli kyucctup hwicli hrasjlutnykfrp hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Echinacea angustifolia* is a PERENNIAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta Attracts butterflies and beneficial insects including parasitic Wasps. General insect (especially bees) nectar plant. Butterfly nectar plant. Shelter plant for beneficial insects. Wildlife Food - seed-eating birds - a favorite of the American Goldfinch. Pioneer Plant - helps reestablish overused or damaged land. Drought Plant - this species can tolerate prolonged dry conditions once established.

dwatta Adaptogen Alterative Antiseptic Depurative Diaphoretic Digestive Sialagogue Stings UrinaryEchinacea is one of the world's most important medicinal herbs. Research shows that it has the ability to raise the body's resistance to bacterial and viral infections by stimulating the immune system[254]. It is also antibiotic and helps to relieve allergies[254]. Plants in this genus were probably the most frequently used of all North American Indian herbal remedies. They had a very wide range of applications and many of these uses have been confirmed by modern science. The

well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Leaves - rich in Vitamin C[179]. Inner bark - dried, ground into a powder and added to flour for making bread[2, 105]. A famine food, it is only used when all else fails[177].

tcanta Dye Rooting hormone Shelterbelt WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. A yellow dye is obtained from the bark[100]. Wood - rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion, very light, soft, elastic. It is used for less good quality purposes such as making matches, packing materials etc[11, 13, 46, 61, 100, 115].

dwatta Alterative Anodyne Antiinflammatory Antiseptic Astringent Diuretic Febrifuge Tonic Urinary Vitamin CThe stem bark is anodyne, anti-inflammatory, antiseptic, astringent, diuretic and tonic[14, 46, 61, 178, 218]. The bark contains salicylates, from which the proprietary medicine aspirin is derived[238]. It is used internally in the treatment of rheumatism, arthritis, gout, lower back pains, urinary complaints, digestive and liver disorders, debility, anorexia, also to reduce fevers and relieve the pain of menstrual cramps[14, 46, 61, 178, 213, 238]. Externally, the bark is used to treat chilblains, haemorrhoids, infected wounds and sprains[238]. The bark is harvested from side branches or coppiced trees and dried for later use[238]. The leaves are used in the treatment of caries of teeth and bones[218]. The twigs are depurative[218].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. This species does not often produce viable seed in Britain[11]. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta Landscape Uses:Erosion control, Aggressive surface roots possible, Specimen. An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circumneutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. This species thrives on drier soils than other members of the genus[188]. It does not do well in exposed upland sites[11] but it is tolerant of maritime exposure, though it can be wind pruned in such a situation[11, 200]. Dislikes shade, it is intolerant of root or branch competition[200]. Tolerates both hot and cool summers[200]. A very ornamental tree, it is fast-growing but fairly short-lived[1, 11, 227]. There are several named varieties[188]. An important food plant for the caterpillars of many species of butterflies[30]. The leaf buds are resinous and exude an aromatic perfume in the spring[245]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200]. Special Features: Not North American native, Invasive, Inconspicuous flowers or blooms.

#### 4.2.260 *Phellodendron amurense*

Amur Cork Tree, Chinese Corktree

3 tin 8 cyuc 1 kcaak 0 tcan 3 dwat 12 m hkuc

htut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprklwis hpa7tmwatli nyanhjen hjonli

drutta *Phellodendron amurense* is a deciduous Tree growing to 12 m (39ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit[105, 177]. The fruit is about 1cm in diameter and has a strong scent of turpentine[200].

tcanta Cork Dye Insecticide Oil WoodA yellow dye is obtained from the inner bark[178]. An oil obtained from the seed has insecticidal properties similar to pyrethrum[57]. Wood - heavy, hard, strong, close grained. Used for furniture[74]. The bark is a cork substitute[74].

dwatta Antibacterial Bitter Chologogue Diuretic Dysentery Expectorant Hypoglycaemic Ophthalmic Skin Stomachic Urinary VasodilatorAmur cork tree, called Huang Bai in China, is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs, but one that should be used with care[218, 254]. A strongly bitter remedy, the bark acts strongly on the kidneys and is regarded as a detoxicant for hot damp conditions[238]. Recent research has shown that the plant is useful in the treatment of meningitis and conjunctivitis[254]. Huang Bai should only be used under professional supervision and should not be taken during pregnancy[254]. The bark is alterative, antibacterial, antirheumatic, aphrodisiac, bitter stomachic, cholagogue, diuretic, expectorant, febrifuge, hypoglycaemic, ophthalmic, skin, vasodilator and tonic[4, 61, 174, 176, 178, 218, 238, 279]. It is taken internally in the treatment of acute diarrhoea, dysentery, jaundice, vaginal infections including Trichomonas, acute urinary tract infections, enteritis, boils, abscesses, night sweats and skin diseases[238, 254]. It is commonly used in conjunction with *Scutellaria baicalensis* and *Coptis chinensis* in a preparation called "injection of three yellow herbs" [238]. It is given intramuscularly for upper respiratory tract infections[238]. The bark of 10 year old trees is harvested in the winter or spring and dried for later use[238, 254]. The fruit is expectorant[218].

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 2 months cold stratification, sow in late winter in a cold frame[78, 113]. Germination is usually good. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Pot up in autumn and over winter in a cold frame. Fair to good percentage[78]. Root cuttings - obtain in December and store in leafmold in a warm place for 3 weeks. Cut into 4cm lengths and plant horizontally in pots. Grow on in a warm greenhouse. Good percentage[78].

nwatta Landscape Uses:Pest tolerant, Specimen, Street tree. Prefers a moisture retentive well-drained deep rich loam in full sun[11, 200]. Prefers a neutral to alkaline soil[238]. Succeeds in shallow chalky soils[245]. Grows best in areas with long hot summers[200]. Plants are gross feeders and require a rich soil if they are to perform well[11]. Dormant plants are fully hardy in Britain[188], but the young growth is liable to damage from late spring frosts[11, 188, 200]. The leaves are aromatic[188]. This species is occasionally cultivated for timber in S.E. Europe[50]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Not North American native, Naturalizing, Inconspicuous flowers or blooms.

#### 4.2.261 *Carpinus caroliniana*

American Hornbeam, Blue Beech, Ironwood, American Hornbeam

3 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 12 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwisslip hpa7tmwatli hjonli

drutta *Carpinus caroliniana* is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen in November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta Edible Parts: SeedEdible Uses: Seed - cooked[105]. An emergency food, used when all else fails[177].

tcanta WoodWood - heavy, close grained, very hard, strong, but not very durable in the soil. It weighs 45lb per cubic foot. Too small to be exploited commercially, this high quality wood is often used locally for flooring, cogs, tool handles, golf clubs etc[46, 61, 82, 171, 226, 227, 229, 235]. It is especially suitable for making levers[171] and is also a good fuel[61].

dwatta *Astringent*American hornbeam was employed medicinally by some native North American Indian tribes, though it is not used in modern herbalism[257]. The inner bark is astringent[257]. An infusion has been used in the treatment of diarrhoea and difficult urination with discharge[257].

propta Seed - best sown in an outdoors seedbed as soon as it is ripe[78]. Germination is usually good, though it may take 18 months[80]. If collected whilst still 'green' (after the seed is ripe but before it has dried fully on the plant) and sown immediately it should germinate in the following spring[80]. Grow the plants on for two years in the seedbed and then plant them out into their permanent positions in the winter. The average seed viability is around 65%[98]. Pre-treat stored seed with 4 weeks warm and 12 weeks cold stratification and sow in a cold frame[98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame until they are at least 15cm tall before planting them into their permanent positions.

nwatta Landscape Uses:Espalier, Pest tolerant, Hedge, Standard, Superior hedge, Specimen, Street tree, Woodland garden. Thrives in any good loam, including chalk, it does not demand much light[1, 11]. Prefers a deep open loam[1]. Grows well in heavy clay soils. A slow-growing and short-lived tree in the wild[229], it is slower growing than *C. betulinus* in cultivation[11]. Seed production is cyclic, a year of heavy yields being followed by 2 - 4 years of low yields[229]. Special Features: North American native, Attracts butterflies, Inconspicuous flowers or blooms.

## 4.2.262 *Salix alaxensis*

Feltleaf Willow

3 tlin 7 cyuc 1 kcaak 2 tcan 2 dwat 10 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfripr hpa7tli flatprikl hpa7tmwatli nyahnjen hjonli

drutta *Salix alaxensis* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

ckaakta Edible Parts: Inner bark Leaves NectarEdible Uses: Inner bark - raw or cooked. A sweet flavour[172], it has been eaten as a winter titbit[257]. The taste is somewhat like watermelon or cucumber[257]. The bark has been used as a survival food[229]. It can be dried, ground into a powder and used as a thickening in soups or can be added to cereal flour for use in making bread etc. Young tender leaves and shoots - raw or cooked[257]. The shoots are peeled and eaten in spring[172]. A source of vitamin C[257]. The flowers have been sucked by children for the sweet nectar[257].

tcanta In northern parts of this plant's range, its wood is often the sole source of firewood[229]. Dynamic accumulator.

dwatta *Anodyne* *Febrifuge* *Vitamin C*The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. It is an aggregate species[172] and ranges in habit from a small tree right down to a dwarf shrub growing along the ground in exposed sites[229]. The following notes are based on the general needs of the genus. Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 4.2.263 *Acer ginnala*

Amur Maple

3 tlin 8 cyuc 1 kcaak 3 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta *Acer ginnala* is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta Edible Parts: Edible Uses: TeaThe young leaves are used as a tea substitute[177, 183].

tcanta *Dye* *Preservative* *Tannin*The leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Black, blue and brown dyes are obtained from the dried leaves[151]. The leaves contain the dyestuff quercetin[223]. They also contain about 30% tannin[223].

dwatta None known

propta Seed of garden origin rarely comes true to type. The seed is best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Fairly easy from cuttings.

nwatta Of easy cultivation, it prefers a good moist well-drained soil on the acid side[11, 182]. Prefers a sunny position but tolerates some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron

lived, cross-pollinated species such as *B. inermis*, which can spread aggressively by rhizomes[269].

## 4.2.359 *Spiraea tomentosa*

Hardhack, Steeplebush

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta *Spiraea tomentosa* is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta None known

tcanta None known

dwatta *Astringent* *Birthing aid* *Diuretic* *Dysentery* *Tonic*The flowers give feebly the medicinal action of salicylic acid (aspirin) and are used in decoction for their diuretic and tonic effect[4]. An infusion of the flowers is used as an astringent[207]. An infusion of the leaves can be used in the treatment of dysentery[257]. An infusion of the flowers and the leaves has been used to counteract the sickness of pregnancy and also to facilitate childbirth[257]. The roots are astringent and have been used in the treatment of diarrhoea[4, 207]. An infusion of the leaves is also used[4, 213].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. A vigorous plant, spreading by subterranean suckers and forming thickets[200]. Closely related to *S. douglasii*[11]. Hybridizes freely with other members of this genus[11].

## 4.2.360 *Solanum carolinense*

Horse Nettle, Carolina horsenettle

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta *Solanum carolinense* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta None known

tcanta *Insecticide*The leaves have been used as an insecticide[257].

dwatta *Anodyne* *Antispasmodic* *Aphrodisiac* *Diuretic* *Epilepsy* *Poultice*This plant should be used with caution, see the notes above on toxicity. The berries and the root are anodyne, antispasmodic, aphrodisiac and diuretic[4, 222]. They have been used in the treatment of epilepsy[207, 222]. They have been recommended in the treatment of asthma, bronchitis and other convulsive disorders[4, 207]. The berries should be harvested when fully ripe and carefully air-dried[4]. An infusion of the seeds has been gargled as a treatment for sore throats and drunk in the treatment of gaitre[257]. A tea made from the wilted leaves has been gargled in the treatment of sore throats and the tea has been

drunk in the treatment of worms[222, 257]. A poultice made from the leaves has been applied to poison ivy rash[222].

propta Seed - sow early spring in a warm greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts.

nwatta Succeeds in most soils[1].

## 4.2.361 *Diervilla lonicera*

Bush Honeysuckle, Northern bush honeysuckle

3 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta *Diervilla lonicera* is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckaakta None known

tcanta *Soil stabilization*The plants stoloniferous habit makes it useful for soil stabilization on banks and slopes[200].

dwatta *Diuretic* *Galactogogue* *Laxative* *Narcotic* *Ophthalmic*The leaves are diuretic[257]. A compound decoction has been used in the treatment of stomach aches[257]. This contrasts with a report that the leaves contain a narcotic principle, inducing nausea[207]. The plant is used as a gargle in catarrhal angina[207]. The root is diuretic, galactogogue, laxative and ophthalmic[257]. A cooled infusion has been used as an eyewash for sore eyes[257]. The bark is laxative and ophthalmic[257]. An infusion has been used to increase milk flow in a nursing mother and as an eyewash for sore eyes[257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if possible, otherwise in late winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers in the spring[200]. Cuttings of half-ripe wood, July/August in a frame[188]. Cuttings of mature wood, late autumn in a frame[188].

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Rock garden, Woodland garden. Succeeds in a moist fertile well-drained soil and is not fussy as to soil type[200]. Succeeds in full sun or partial shade[188]. Plants are hardy to about -30°C[200]. This species is a spreading suckering plant[11], it makes a useful understory planting in woodlands[200]. Any pruning can be carried out in the winter or after flowering[188]. 2 or 3 year old stems can be removed in order to promote a more shapely bush[188]. Flowers are produced on the current seasons growth[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Attractive flowers or blooms.

## 4.2.362 *Artemisia vestita*

Russian Wormwood

3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 1.2 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta *Artemisia vestita* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

ckaakta None known

tcanta None known

hmimhtut cyutli tcup hwicli hyhshras]lutnyik hpa7tli flatprinklwis hpa7tmwatli fyfibre7t hjonli

drutta Aster puniceus is a PERENNIAL growing to 1.3 m (4ft 3in) by 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Landscape uses: Forest garden, Cottage gardens, Water garden, Wildlife garden, Moist Prairie or Meadow, Perennial borders. Attracts wildlife: Butterfly nectar plant, Butterfly host plants.

dwatta The roots are diaphoretic, emmenagogue and febrifuge[257]. A decoction has been used in the treatment of colds, consumption, typhoid, pneumonia and fevers[257]. A decoction has been used to promote menstruation - this can lead to an abortion[257]. The decoction has also been used to restore a woman to health after giving birth[257]. The chewed root has been applied to an aching tooth to allay the pain[257].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200], but it also succeeds in partial shade[233]. Prefers a rich soil[1], but tolerates poor ones[233]. Plants are hardy to about -25°C[187]. The crushed plant has a smell like juniper berries[257]. Hybridizes freely with other members of this genus[200]. Plants need to be divided every few years, preferably in the spring, in order to keep the plant vigorous[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. Attracts butterflies and moths, it is also a good bee plant providing nectar in autumn[30].

### 4.2.357 Artemisia filifolia

Sand Sage, Sand sagebrush

3 tlin 7 cyuc 0 kcaak 1 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hras]lut hpa7tli prinklwis hpa7tmwatli xre7t hjonli

drutta Artemisia filifolia is a deciduous Shrub growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta MiscellanyThe leaves are very soft and have been used as a substitute for toilet paper[257]. It is sometimes used for revegetation efforts on rangeland and coal fields.

dwatta Carminative Miscellany StomachicThe plant is carminative and stomachic[61, 257]. A tea is used in the treatment of indigestion[216]. An infusion of the plant and juniper branches is used in the treatment of indigestion[257]. A strong infusion of the plant is used as a lotion on snakebites[257]. The plant is also used to treat boils[257].

propta Seed - surface sow from late winter to early summer in a greenhouse in a very free-draining soil, but make sure that the compost does not dry out. The seed usually germinates within 1 - 2 weeks in a warm greenhouse. When

large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame. Division in spring or autumn[200].

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.358 Bromus inermis

Smooth Brome, Pumpelly's brome

3 tlin 7 cyuc 0 kcaak 2 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli kyuctcup hwicli hras]lutnyik hpa7tli flatprinklwis hpa7tmwatli xre7t hjonli

drutta Bromus inermis is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta Soil stabilizationAn excellent plant to grow for controlling soil erosion because of its fast-growing interlocking root system[269]. It is especially valuable in semi-arid regions, such as the Prairie Provinces of Canada and the Great Plains of the United States[269]. Growth starts early in spring with a further period of growth in early autumn under favourable moisture conditions[269].

dwatta None known

propta Seed - sow spring in situ. The seedbed should be firm and seed should not be covered to more than 6 - 13 mm depth. Seed rates of 3.3 kilos per hectare are used when the plant is sown in a pure stand, though it is more often sown in a mixture with various legumes such as alfalfa, sweet clover, red clover or Lotus corniculatus[269]. There are approximately 300,000 seeds per kilo[269].

nwatta Best adapted to regions with moderate rainfall and moderate cool summer temperatures, it is suited to spring or clay soils and deep loams, but also does well on light sandy soils and on well-drained soils. Plants are less drought resistant than crested wheatgrass and they do not tolerate temperature extremes. Smooth brome is suited for irrigated areas but is not recommended for saline or alkali soils[269]. Smooth brome is reported to tolerate an annual precipitation of 32 to 176cm, an annual average temperature range of 4.3 to 19.9°C and a pH in the range of 4.9 to 8.2[269]. Smooth brome is also reported to tolerate alkali conditions, disease, drought, frost, fungi, grazing, mycobacterium, salt, viruses, and weeds[269]. There are a number of named varieties, selected mainly as hay and pasture crops. These cultivars are divided into two groups, northern and southern. The southern group is less cold-hardy and does not survive average winter conditions further north than southern Minnesota in N. America, the northern group is much more cold tolerant[269]. The genus Bromus contains many complex, polyploid series. Bromus inermis belongs to section Bromopsis, containing wild species with chromosome numbers ranging from 2x to 8x. Following its introduction to North America, smooth broome, an aggressive species, has tended to replace native American species of sect. Bromopsis, especially B. pumpellianus. Hybridization studies have been made between: B. inermis, 8x; B. pumpellianus, 8x; and material of the introduced B. erectus complex (6x, 8x, 10x, though the last is probably itself hybrid). An objective of these studies was to incorporate into inermis the larger seeds of pumpellianus and better seedling vigour of erectus. The three species are related, crossable and give quite fertile hybrids. Collections of B. inermis in North America show varying meiotic irregularity and aneuploidy. This is probably a result of introgression from B. pumpellianus and the B. erectus complex. Quite a high degree of meiotic irregularity may be tolerated under natural conditions in a long

deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. A very ornamental tree[1], there are some named varieties[11]. The form 'Baily Compact' is a compact form originating in N. America. Very closely related to and possibly only a ssp. of A. tataricum[11]. The dried leaves are exported to China in large quantities for their use as a dye[151]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20].

### 4.2.264 Acer truncatum

Shantung Maple, Purplebloss Maple

3 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hras]lutnyikfrip hpa7tli flatprinklwis hpa7tmwatli hjonli

drutta Acer truncatum is a deciduous Tree growing to 8 m (26ft 3in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - roasted[105, 177]. Rather small and fiddly to utilize[K].

tcanta Companion PreservativeThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. The seed of this species has hypogeal germination, that is the true seed leaves remain below the soil and the first leaves to appear above soil level are true leaves. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Container, Standard, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil[11] and a sunny position but tolerates some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Plants produce prodigious root growth but little top growth in first year from seed[133]. This species is closely related to A. mono[11]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 4.2.265 Prunus cerasus

Sour Cherry

3 tlin 7 cyuc 1 kcaak 3 tcan 2 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hras]lutnyik hpa7tli frusflatprinklwis hpa7tmwatli fyfibre7t hjonli

drutta Prunus cerasus is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very

acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Gum Gum Oil Oil TeaFruit - raw or cooked[1, 2, 5, 11, 12]. Pleasantly acid, the fruit can be eaten out of hand, used in pies, preserves etc or dried for later use[183]. The fruit is about 18mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible oil is obtained from the seed[46, 61]. When refined it is used as a salad oil[183]. The leaves are used as a tea substitute[46, 61, 183]. A gum obtained from the trunk is used for chewing[61, 64].

tcanta Adhesive Dye Gum Gum Hedge Hedge Oil Oil WoodAgroforestry Uses: Plants can be grown as a hedge[50 ], succeeding in fairly exposed positions[K ]. An excellent nectar plant, yielding both nectar and pollen[74 ]. Other Uses: An edible drying oil obtained from the seed is also used in cosmetics[61 ]. Seeds contain an almond -flavoured fatty oil (24 - 35%) which rapidly becomes more bitter; this is used in the manufacture of soap and is suitable for burning. The oil contains a large quantity of amygdalin[74 ]. The stones are used as well: according to American data, 1,000 tons of stones yields 448 tons of kernels which can yield to 96,235.5 kg (95,563 liters) of syrup, 22,736 liters of spirits, 338,130 liters of gum, 200 tons of powder, 3 tons of essential oil, and 4.134 tons of fatty oil[74 ]. The gum obtained from the stem can be used as an adhesive[61, 64 ]. It is used in the manufacture of cloth[74 ] (as a size?). A green dye can be obtained from the leaves[168 ]. A dark grey to green dye can be obtained from the fruit[168 ]. The plant can be used as a rootstock for cultivated cherries[74 ]. The plant is used in breeding programmes for the sweet cherry. The bark contains 5 - 7% tannins, including some quercetin[74 ]. The yellowish red wood is compact, rather heavy. It is suitable for use in woodwork and lathework for making pipes, cigarette holders, hoops for barrels etc[74 ].

dwatta Astringent Bitter Febrifuge Nervine SalveThe bark is astringent, bitter and febrifuge[240]. An infusion of the bark has been used in the treatment of fevers, coughs and colds[257]. The root bark has been used as a wash for old sores and ulcers[257]. The seed is nervine[240]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers during the dormant season. They can be planted out direct into their permanent positions.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Prefers an acid soil according to another report[5]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Plants are succeeding in a fairly exposed maritime position at Rosewarne in N. Cornwall[K]. Plants are hardy to about -20°C[184]. Long cultivated for its edible fruit, there are many named varieties[1, 50]. See separate entries for the various sub-species[K]. It is also a parent, with P avium, of many cultivars of sweet cherries[1, 17]. Many cultivars will succeed on a north or east facing wall[219]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants produce suckers freely[184]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" expe-

rienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2].

## 4.2.266 Euonymus europaeus

Spindle Tree, European spindle tree

3 tlin 7 cyuc 1 kcaak 3 tcan 2 dwat 6 m hkuc hmimhtut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatprklwisslip hpa7tmwatli xre7t hjonli

drutta Euonymus europaeus is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckahta Edible Parts: Manna OilEdible Uses: Colouring OilAn edible yellow dye is obtained from the fruit and seed[46, 61, 103, 183]. Pink from the fruit case, orange from the seed[141]. These reports should be treated with some caution since many members of this genus are poisonous. One report suggests that the plant is a source of a manna[183], there are no further details.

tcanta Charcoal Dye Insecticide Latex Oil Parasiticide WoodThe whole plant yields a volatile oil that is used in soap making[13, 46]. Other reports say that the oil is obtained from the seed[46, 61, 103, 115]. It is possible that there are two oils, an essential oil from the plant and an oil from the seed[K]. A good yellow dye is obtained from the fleshy coating around the seeds[4]. This becomes green with the addition of alum, but unfortunately both colours are rather fugitive[4]. The baked and powdered berries are used to remove lice from the hair[6, 19, 66], they are also used as an insecticide[15]. The leaves are used[115]. Roots yield up to 4% gutta-percha, a non elastic rubber used as an electrical insulation and for making plastics[74]. Wood - very hard, easily split, fine-grained, not durable[4, 6, 13, 46]. Used for spindles, skewers, knitting needles, toothpicks, carving etc[6, 100, 103]. A high quality charcoal is obtained from the wood, it is used by artists[46, 74, 103, 115].

dwatta Alterative Cholagogue Hepatic Laxative Parasiticide Purgative Stimulant TonicThe bark is alterative, cholagogue, hepatic, laxative, stimulant and tonic[4, 7]. The root bark is the part normally used, though bark from the stems is sometimes employed as a substitute[4]. In small doses it stimulates the appetite, in larger doses it irritates the intestines[4]. The bark is especially useful in the treatment of liver disorders which follow or accompany fevers[4]. The seeds are strongly emetic and purgative[4]. The fresh leaves, and the dried fruit and seeds, are used externally to treat scabies, lice (head, body or pubic), ticks and other skin parasites[268].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. One report says that the seed can be sown in an outdoors seedbed in early spring with good results[78]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[78]. Cuttings of mature wood, November in a frame[113]. Layering in July/August. Takes 14 months[78].

nwatta An easily grown plant, it thrives in almost any soil, including chalk, and is particularly suited to dry shaded

areas[200]. Prefers a well-drained loamy soil[1]. If cultivated for its latex it is best grown in a dry open position[74]. A very cold-hardy plant, tolerating temperatures down to about -25°C[184]. A very ornamental plant, there are many named varieties[11]. This species is often damaged by caterpillars during the flowering season[11]. It is a favoured home for blackfly, so should not be grown near broad beans[121]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching; a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 4.2.267 Syringa vulgaris

Lilac, Common lilac

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 6 m hkuc htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli prklwisslip hpa7tmwatli xre7t hjonli

drutta Syringa vulgaris is a deciduous Shrub growing to 6 m (19ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: FlowersEdible Uses: Flowers - raw or folded into batter and fried to make fritters[183].

tcanta Dye Essential Hedge Hedge RootstockAn essential oil is obtained from the flowers. Used in perfumery[171]. A green dye is obtained from the flowers[168]. Green and brown dyes can be obtained from the leaves[168]. A yellow-orange dye is obtained from the twigs[168]. Plants can be grown as an informal hedge[200]. The plant is often used as a rootstock for the various ornamental cultivars of lilac. Its main disadvantage is that it can sucker very freely[200].

dwatta Antiperiodic Febrifuge Mouthwash Tonic VermifugeThe leaves and the fruit are antiperiodic, febrifuge, tonic and vermifuge[4]. The bark or leaves have been chewed by children as a treatment for sore mouth[257].

propta Seed - sow March in a north facing cold frame. Pre-treating the seed with 4 weeks warm then 3 weeks cold stratification improves germination. It is probable that sowing the seed as soon as it is ripe in a cold frame would be a more reliable method[K]. Prick the seedlings out into individual pots once they are large enough to handle. Plant them out in the summer if sufficient growth has been made, otherwise grow them on in a cold frame for their first winter and plant out in late spring of the following year. Cuttings of young shoots, 7cm with a heel, June in a frame[200]. Cuttings of half-ripe wood, 7cm with a heel, July/August in a frame[200]. Layering in spring before new growth begins. Takes 12 months[78]. Division of suckers in late winter. They can be planted straight out into their permanent positions.

nwatta Landscape Uses:Border, Standard, Seashore, Specimen. Succeeds in most soils, including chalk, but dislikes acid soils[11]. Prefers a deep stiff well-drained loam in a warm sunny position[11, 200]. A very ornamental plant[1], it does tend to sucker quite freely though[200]. There are many named varieties, developed for their ornamental value[182]. The flowers attract butterflies and moths[30]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Blooms are very showy.

## 4.2.268 Hamamelis virginiana

Witch Hazel, American witchhazel, Common Witchhazel, Virginian Witchhazel, Witchhazel

3 tlin 8 cyuc 1 kcaak 0 tcan 5 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjtut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Hamamelis virginiana is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower

## 4.2.353 Eupatorium capillifolium

Dogfennel

3 tlin 10 cyuc 0 kcaak 0 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli fyfxtre7t hjonli

drutta Eupatorium capillifolium is a PERENNIAL growing to 3 m (9ft 10in). The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta None known tcanta Repellent StrewingThe plant is used as a strewing herb and to discourage insects[61].

dwatta StingsThe entire plant is applied externally as a remedy for the bites of reptiles and insects[61].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta We have very little information on this species but, judging by its habitat, it should be hardy in Britain. Other members of this genus succeed in ordinary well-drained but moisture retentive garden soil in sun or part shade[200]. Plants seem to be immune to the predations of rabbits[233]. An aggressive and weedy species[43]. Special Features: North American native, Invasive.

## 4.2.354 Filipendula rubra

Queen Of The Prairie, Meadowsweet

3 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli prklwis hpa7tmwatli fyfxtre7t hjonli

drutta Filipendula rubra is a PERENNIAL growing to 2.5 m (8ft) by 1.3 m (4ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kckahta None known

tcanta None known

dwatta Analgesic Antiinflammatory Astringent Cardiac DysenteryThe root is rich in tannin, it is used as an astringent in the treatment of diarrhoea, dysentery, bleeding etc[222]. It has also been used in the treatment of various heart complaints[257]. The plant probably contains salicylic acid, the chemical forerunner of aspirin[222]. This is anti-inflammatory and analgesic[222].

propta Seed - best sown in the autumn in a cold frame[1]. The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Specimen. Requires a humus-rich moist soil in semi-shade[200]. Succeeds in full sun only if the soil is reliably moist throughout the growing season[200]. Dislikes dry or acid soils[1, 17]. Does well in marshy soils[24, 200]. Grows well in heavy clay soils. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Although the plants are perfectly hardy in Britain, they appreciate the winter protection of bracken or some similar mulch when grown in areas of prolonged frosts[200]. Plants spread fairly freely and

form large clumps[233]. There is at least one named variety, selected for its ornamental value[200]. The flowers are very attractive to bees[24, 30]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, North American native, Suitable for cut flowers.

## 4.2.355 Silphium perfoliatum

Cup Plant, Rosinweed

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Silphium perfoliatum is a PERENNIAL growing to 2.5 m (8ft 2in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta None known

tcanta None known

dwatta Alterative Antispasmodic Diaphoretic Emmenagogue Febrifuge Hepatic Pectoral Stimulant Styptic Tonic Women's complaintsCup plant was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. A decoction of the root has been used to treat the stoppage of periods, and also to treat morning sickness and to prevent the premature birth of a child[257]. In view of these conflicting uses, it is best that it is not used by pregnant women unless under the guidance of a qualified practitioner[257]. The root is alterative, antispasmodic, diaphoretic, emmenagogue, febrifuge, hepatic, stimulant, styptic and tonic. It is used in the treatment of liver and spleen disorders and has also been used to treat morning sickness[4, 61, 257]. A decoction of the root has been used internally in the treatment of back and chest pain and lung haemorrhages[257]. A decoction of the root has been used as a face wash to treat paronychia[257]. A poultice of the moistened dried root has been applied to wounds to stop the bleeding[257].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Division in spring[188]. This is very difficult due to the deep and extensive root system.

nwatta Landscape Uses:Border, Massing, Specimen, Woodland garden. Succeeds in any ordinary garden soil[1]. Prefers a deep moisture retentive moderately fertile soil that is not too nitrogen rich, in sun or dappled shade[200]. Hardy to at least -25°C[187]. Plants have a deep and extensive root system which makes transplanting difficult. An aromatic resin exudes from the crushed leaves and stems[245]. Special Features: Attracts birds, Attractive foliage, North American native, Naturalizing, Attracts butterflies. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 4.2.356 Aster puniceus

Purplestem Aster

3 tlin 8 cyuc 0 kcaak 2 tcan 2 dwat 1.3 m hkuc

kcakta None known  
tcanta PreservativeThe leaves are packed around aples, rootcrops etc to help preserve them[18, 20]. The wood is light, soft, close-grained and satiny, it weighs 33lb per cubic foot[82, 235]. It is not used commercially, though it is sometimes used for fuel[226].

dwatta Antiemetic Emetic Kidney PectoralA tea made from the inner bark is used in the treatment of colds, coughs, bronchitis, kidney infections, gonorrhoea and the spitting of blood[222]. A wash is used externally on swollen limbs and as a wash for paralysis[222]. A tea made from the leaves and twigs is used to both allay and induce vomiting, depending on the dosage[222].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Grafting is not usually advised for this species, though any cultivars can be grafted onto rootstocks of the species.

nwatta Landscape Uses:Erosion control. Of easy cultivation, it prefers a sunny position or light dappled shade and a good moist well-drained soil but succeeds on most soils, especially those on the acid side, and dislikes alkaline soils[182, 200]. Grows well in heavy clay soils. Plants are hardy to about -25°C when they are fully dormant[200]. A good tree for street planting[200]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:North American native, Inconspicuous flowers or blooms.

### 4.2.351 Physocarpus opulifolius

Ninebark, Common ninebark, Atlantic ninebark, Ninebark 3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Physocarpus opulifolius is a deciduous Shrub growing to 3 m (9ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Emetic Infertility Laxative Women's complaintsA tea made from the inner bark is laxative and emetic[222, 257]. It is used internally to treat women's complaints, gonorrhoea, TB and to enhance fertility[222, 257]. It is also used as a wash on scrofulous glands in the neck[257]. Some caution is advised, this herb is best used only under the supervision of a qualified practitioner. See the notes above on toxicity.

propta Seed - we do not have any information for this species but suggest sowing the seed as soon as it is ripe if possible in a cold frame. If sown in the spring it is likely to require a period of cold stratification. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers in the dormant season. Cuttings of green-wood, June in a closed frame[200].

nwatta Landscape Uses:Border, Foundation, Massing, Specimen. Prefers an acid soil, quickly becoming chlorotic

when growing on shallow chalk[200]. Succeeds in a moist moderately fertile soil in full sun[200]. A very hardy plant, tolerating temperatures down to at least -25°C[200]. There are many named varieties, selected for their ornamental value[200]. Flowers are produced on the previous year's growth[11]. A useful plant for rough shrubberies where plants are more or less left to look after themselves[11]. Special Features:Attractive foliage, North American native, Blooms are very showy.

### 4.2.352 Rhus vernix

Poison Sumach

3 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 3 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Rhus vernix is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in July, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: OilEdible Uses: OilNone known

tcanta Dye Ink Miscellany Mordant Oil Varnish WoodThe leaves are rich in tannin. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. An indelible black ink can be made from the sap[226]. A varnish is obtained from the sap, it is black, lustrous and durable[19, 82].The final product is toxic[226]. Wood - light, soft, coarse grained[82]. It weighs 27lb per cubic foot[235].

dwatta Febrifuge Miscellany SkinPoison sumach has occasionally been used medicinally, though it is an extremely poisonous plant and great caution should be exercised. Any herbal use should only be undertaken under the supervision of a qualified practitioner. See also the notes above on toxicity. The plant has been used in the treatment of fevers, ague, ulcerated bladder, asthma and wasting diseases[257]. The plant has been used as a wash to treat foul ulcers[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. Requires a moist soil[14]. The young growth in spring can be damaged by late frosts. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. Many of the species in this genus, including this one, are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

from September to November, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: TeaSeed - raw or cooked[232]. An oily texture[4, 102, 177, 213]. The seeds are about the size of a barley grain and have a thick bony coat[2]. The reports of edibility must be treated with some suspicion, they all seem to stem from one questionable report in the 'Medical Flora' of Refnesque[2]. A refreshing tea is made from the leaves and twigs[102, 105, 177, 257].

tcanta Cosmetic Miscellany Rootstock Tannin WoodUsed as a rootstock for the ornamental species in this genus[182]. The plant is very rich in tannin[7]. It is used cosmetically as an ingredient in almost any preparation made to relieve capillary weaknesses[7]. The stems have been used for water divining[257]. Wood - heavy, hard, very close grained[82]. It weighs 43lb per cubic foot[235]. The trees are too small to be a useful lumber source[229].

dwatta Antidiarrhoeal Astringent Dysentery Haemostatic Homeopathy Miscellany Sedative TonicWitch hazel bark is a traditional herb of the North American Indians who used it to heal wounds, treat tumours, eye problems etc[254]. A very astringent herb, it is commonly used in the West and is widely available from both herbalists and chemists[222]. It is an important ingredient of proprietary eye drops, skin creams, ointments and skin tonics[238]. It is widely used as an external application to bruises, sore muscles, varicose veins, haemorrhoids, sore nipples, inflammations etc[238]. The bark is astringent, haemostatic, sedative and tonic[4, 14, 21, 165, 171, 222]. Tannins in the bark are believed to be responsible for its astringent and haemostatic properties[222]. Bottled witch hazel water is a steam distillate that does not contain the tannins from the shrub[222], this is less effective in its action than a tincture[238]. The bark is used internally in the treatment of diarrhoea, colitis, dysentery, haemorrhoids, vaginal discharge, excessive menstruation, internal bleeding and prolapsed organs[238]. Branches and twigs are harvested for the bark in the spring[238]. An infusion of the leaves is used to reduce inflammations, treat piles, internal haemorrhages and eye inflammations[213]. The leaves are harvested in the summer and can be dried for later use[238]. A homeopathic remedy is made from fresh bark[232]. It is used in the treatment of nosebleeds, piles and varicose veins[232].

propta Seed - this can be very slow to germinate. It is best to harvest the seed 'green' (as soon as it is mature but before it has dried on the plant) around the end of August and sow it immediately in a cold frame[80, 98]. It may still take 18 months to germinate[200] but will normally be quicker than stored seed which will require 2 months warm stratification then 1 month cold followed by another 2 weeks warm and then a further 4 months cold stratification[113]. Scarification may also improve germination of stored seed[80]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Overwinter them in a greenhouse for their first winter and plant out in late spring[78]. Layering in early spring or autumn[78, 200]. Takes 12 months. Good percentage[78]. Softwood cuttings, summer in a frame[200].

nwatta Landscape Uses:Border, Pest tolerant, Specimen, Woodland garden. Prefers a moist sandy loam[14, 130] in a sunny position[11], though it tolerates some shade[14]. Prefers a rich well-drained soil[1]. Dislikes dry limy soils but will succeed in a calcareous soil if it is moist[130]. Prefers a position sheltered from cold drying winds in a neutral to slightly acid soil[200]. A very hardy plant tolerating temperatures down to about -35°C[184]. Plants seldom produce seeds in Britain[4]. Witch hazel is a widely used medicinal herb. The bark is harvested commercially from the wild in N. America[61]. The twigs have been used in the past as dowsing rods for water divining[229]. A slow growing shrub, it takes about 6 years to flower from seed[200]. The flowers have a soft sweet perfume[245]. This species is notably susceptible to honey fungus[200]. Special Features: North American native, Attracts butterflies, Fragrant flowers, Inconspicuous flowers or blooms.

### 4.2.269 Lonicera chrysantha

Honeysuckle

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lonicera chrysantha is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177]. The fruit is about 7mm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta An easily grown plant, succeeding in any fertile soil, and preferring a good moist soil in a sunny position[200]. It does not fruit so well when grown in the shade[200]. A very hardy plant, tolerating temperatures down to about -40°C[200]. Flowers and fruits are freely produced in Britain[184]. Closely related to *L. demissa*[182]. Some named forms have been developed for their ornamental value[182].

### 4.2.270 Hydrangea paniculata

Paniced hydrangea, Hybrid Hydrangea, PeeGee Hydrangea, Panic Hydrangea

3 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli xre7t hjonli

drutta Hydrangea paniculata is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: RutinThe flowers contain up to 4.06% rutin[240].

tcanta Nails Paper WoodThe bark is used to make Japanese paper[46, 61, 74]. Wood - hard, white, fine grained. Used for small items, nails, walking sticks etc[46, 61, 74].

dwatta Blood tonicThe flowers contain up to 4.06% rutin[240]. This makes them useful for reducing the incidence of recurrent haemorrhages associated with increased capillary fragility, particularly in hypertension[240]. The flowers also contain 2.5% of a phenolic compound[240].

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Landscape Uses: Border, Massing, Specimen, Woodland garden. Tolerates most soil[200], thriving in a

well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Tolerates boggy soils[74]. Dislikes very alkaline soils[202]. Does well on very acid soils with a pH around 4.5[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Plants are hardy to about -25°c[184] when dormant but the young growth in spring can be killed by late frosts. A fast-growing plant[202]. A number of cultivars have been selected for their ornamental value[182]. Plants are very tolerant of pruning and can be cut back into old wood if required[188]. This species is notably susceptible to honey fungus[200]. Special Features: Not North American native, Suitable for cut flowers, Suitable for dried flowers, Blooms are very showy.

## 4.2.271 Ilex glabra

Inkberry  
 3 tin 7 cyuc 1 kcaak 2 tcan 0 dwat 3 m hkuc  
 hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli nyanhjen hjonli  
 drutta Ilex glabra is an evergreen Shrub growing to 3 m (9ft) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe dried roasted leaves are a good substitute for yaupon tea. They contain caffeine[161, 183].

tcanta Hedge HedgeA good hedging plant, the var. 'Compacta' is used[100].

dwatta None known  
 propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged[200]. Another report says that it needs an acid soil[182]. Hardy to about -20°c[184]. Plants are very slow growing[11] and seldom exceed 1metre in height in British gardens[184]. Plants have stoloniferous roots[182]. This species is closely related to I. coriacea[182]. There are some named varieties, selected for their ornamental value[200]. Resents root disturbance, especially as the plant grows older[1, 11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required. A report says that some plants are monoecious. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin

to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2].

## 4.2.272 Eupatorium purpureum

Gravel Root  
 3 tin 9 cyuc 1 kcaak 2 tcan 3 dwat 2 m hkuc  
 hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Eupatorium purpureum is a PERENNIAL growing to 2 m (6ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: SaltThe roots have been burnt and their ashes used as salt to flavour foods[257]. tcanta Dye StrawThe stems have been used as straws[257]. The fruits yield a pink or red textile dye[268].

dwatta Astringent Diuretic Nervine Tonic UrinaryGravel root was used by the native N. American Indians as a diaphoretic to induce perspiration and break a fever. The plant was quickly adopted by the white settlers and still finds a use in modern herbalism[268]. The whole plant, but especially the root, is astringent, diuretic, nervine and tonic[4, 21, 165]. It works particularly on the genito-urinary system and the uterus[238]. Especially valuable as a diuretic and stimulant, as well as an astringent tonic[4], a tea made from the roots and leaves has been used to eliminate stones from the urinary tract, to treat urinary incontinence in children, cystitis, urethritis, impotence etc[222, 254, 268]. It is also said to be helpful in treating rheumatism and gout by increasing the removal of waste from the kidneys[254, 257]. The leaves and flowering stems are harvested in the summer before the buds open and are dried for later use. The roots are harvested in the autumn and dried for later use[238].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Landscape Uses:Border, Massing, Specimen, Woodland garden. Succeeds in ordinary garden soil that is well-drained but moisture retentive in sun or part shade[200]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very cold-hardy plant, tolerating temperatures down to about -25°c[187]. The bruised leaves have a vanilla-like odour[213]. Plants seem to be immune to the predations of rabbits[233]. Butterflies are attracted to this plant[187]. Special Features:North American native, Fragrant foliage, Naturalizing, Wetlands plant, Attracts butterflies, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 4.2.273 Euonymus alatus alatus

Winged Spindle Tree  
 3 tin 7 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc  
 hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwslip hpa7tmwatli xre7t hjonli

mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta None known  
 tcanta Dye Hedge Hedge WoodA green dye is obtained from the immature fruit[46, 57, 103, 115, 171]. Mixed with gum arabic and limewater, it makes a green pigment used in watercolour painting[238]. Yellow, orange and brownish dyes can also be obtained[100]. The colours are rich but fugitive[4]. A yellow dye is obtained from the bark[61, 100, 115]. It has been used to colour paper and maps[238]. Often grown as an informal hedge, it is also amenable to trimming[21, 186, 200]. Wood - hard, handsome with a marble-like grain. Used for small turnery[46, 61, 74].

dwatta Cathartic Depurative Diuretic Laxative PurgativeBoth the bark and the fruit of common buckthorn have been used for their purgative effect upon the body, however they can be rather violent in their action and so are rarely used in human medicines[244]. The berries, harvested when fully ripe, are cathartic, depurative, diuretic, laxative and violently purgative[1, 4, 9, 19, 46, 61, 218, 238]. About 8 - 15 of the mature fruits, chewed before breakfast, are a strong and effective laxative for adults, they should not be used by children[9]. An infusion of the not quite mature fruits is gentler in its action[9]. Use with caution, in large doses the fruit can cause vomiting and violent diarrhoea[9, 21]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Rhamnus cathartica for constipation (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed will require 1 - 2 months stratification at 5°c and should be sown as early in the year as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta Succeeds in any reasonably good soil[11]. Prefers a dry or moist calcareous soil[1, 4, 9] in sun or light dappled shade[200]. This species is hardy to at least -15°c[238]. Plants regenerate well after cutting or burning but young plants are rather prone to frost damage when grown in an exposed position[186]. Plants are resistant to cattle grazing but young plants can be damaged by rabbits[186]. Plants have a very shallow root system[186]. This species often bears the aecidiospore stage of 'crown rust' of oats so it should not be grown near cereals[1, 186]. The species in this genus are notably resistant to honey fungus[200]. A good bee plant[4, 108] and a main food plant for the brimstone butterfly[186]. Dioecious. Male and female plants must be grown if seed is required.

## 4.2.349 Rhamnus frangula

Alder Buckthorn  
 3 tin 7 cyuc 0 kcaak 3 tcan 3 dwat 5 m hkuc  
 hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flat-prikliws hpa7tmwatli xre7t hjonli

drutta Rhamnus frangula is a deciduous Shrub growing to 5 m (16ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None known  
 tcanta Charcoal Dye Hedge Hedge Nails WoodA yellow dye is obtained from the leaves and bark[4, 115]. It is much used in Russia and turns black when mixed with salts of iron[4]. A green dye is obtained from the unripe fruit[4, 115]. A blue or grey dye is obtained from the ripe berries[4, 115]. Plants can be grown as an informal (untrimmed) hedge, though they are also amenable to trimming[200]. The cultivar 'Tallhedge (syn 'Colummaris') is very suitable for this purpose[200]. The wood is used to make wooden nails, shoe lasts, veneer etc[46, 61]. It is the source of a high quality

charcoal that is used by artists[4, 11, 13, 17, 100, 115, 182, 186].

dwatta Aperient Cathartic Cholagogue Laxative Purgative Tonic VermifugeAlder buckthorn has been used medicinally as a gentle laxative since at least the Middle Ages[244]. The bark contains 3 - 7% anthraquinones, these act on the wall of the colon stimulating a bowel movement approximately 8 - 12 hours after ingestion[254]. It is so gentle and effective a treatment when prescribed in the correct dosages that it is completely safe to use for children and pregnant women[244]. The bark also contains anthrones and anthranols, these induce vomiting but the severity of their effect is greatly reduced after the bark has been dried and stored for a long time[254]. The bark is harvested in early summer from the young trunk and moderately sized branches, it must then be dried and stored for at least 12 months before being used[4, 238]The inner bark is cathartic, cholagogue, laxative (the fresh bark is violently purgative), tonic, vermifuge[4, 9, 13, 21, 165]. It is taken internally as a laxative for chronic atonic constipation and is also used to treat abdominal bloating, hepatitis, cirrhosis, jaundice, and liver and gall bladder complaints[238]. It should be used with caution since excess doses or using the bark before it is cured can cause violent purging[9, 21]. Externally, the bark is used to treat gum diseases and scalp infestations[238], or as a lotion for minor skin irritations[244]. The fruit is occasionally used, it is aperient without being irritating[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Rhamnus frangula for constipation (see [302] for critics of commission E).

propta Seed - best sown in the autumn in a cold frame. Stored seed will require 1 - 2 months cold stratification at about 5° and should be sown as early in the year as possible in a cold frame or outdoor seedbed[200]. Germination is usually good, at least 80% by late spring. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta An easily grown plant, it succeeds in any reasonably good soil[11, 98], preferring neutral to acid conditions[238]. It grows well on damp or peaty soils[98]. Prefers a moist moderately fertile soil in sun or semi-shade[200]. Grows well in wet soils but not if they are water-logged[186]. Dislikes drought or exposure to strong winds[186]. Plants are hardy to at least -15°c[238]. Alder buckthorn is a slow-growing plant, though it coppices well. It was at one time often grown for its wood which was used in making charcoal[186]. The plants regenerate well after forest fires or grazing[186]. Plants flower on one-year old wood and also on the current year's growth[4]. Cultivated as a medicinal plant in S. Europe[57]. Often bears the aecidiospore stage of 'crown rust' of oats[1]. The species in this genus are notably resistant to honey fungus[200]. A good bee plant[4] and a main food plant for the larvae of the yellow brimstone butterfly[186]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 4.2.350 Acer pensylvanicum

Moosewood, Striped maple, Moosewood, Pennsylvania Maple  
 3 tin 7 cyuc 0 kcaak 0 tcan 1 dwat 4.5 m hkuc  
 htut cyutli tcup hwicli hrasjlutnyikfrrip hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Acer pensylvanicum is a deciduous Tree growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.



notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

#### 4.2.346 *Salix bebbiana*

Beak Willow, Bebb Willow

3 tin 7 cyuc 0 kcak 4 tcan 2 dwat 7 m hkuc htut cyutli tcuphja7n hwicli hrasljutnykfrp hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix bebbiana* is a deciduous Shrub growing to 7 m (23ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Basketry Charcoal Fibre Pioneer WoodA pioneer species, readily invading any cleared-out area if there is sufficient moisture[229]. It is short-lived and not very shade tolerant and so, having provided good conditions for other woodland trees to become established, it is eventually out-competed by them[K]. The pliable stems are used in basket making[226, 229]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The bark has been twisted into cord and made into strong rope, bags and dresses[257]. The bark has been used for sewing birch bark onto basket frames[257]. The wood often has diamond-shaped depressions on the bark caused by a fungus. This wood is considered to be very ornamental and is carved into canes, lamp posts and furniture[229]. The wood has also been used to make baseball bats and to make charcoal[229]. Dynamic accumulator.

dwatta Anodyne Astringent Febrifuge PoulitceA poultice of the chewed root inner bark has been applied to a deep cut[257]. The shredded inner bark has been used as sanitary napkins to 'heal a woman's insides'[257]. A poultice of the damp inner bark has been applied to the skin over a broken bone[257]. A decoction of the branches has been taken by women for several months after childbirth to increase the blood flow[257]. A poultice of the bark and sap has been applied as a wad to bleeding wounds[257]. The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in moist soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. A fast-growing but short-lived species[229]. This species is closely related to *S. starkeana*, differing mainly in its more vigorous habit[11]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

#### 4.2.347 *Cornus alternifolia*

Green Osier, Alternateleaf dogwood, Alternate Leaf Dogwood, Golden Shadows Pagoda Dogwood, Green Osis 3 tin 8 cyuc 0 kcak 0 tcan 2 dwat 6 m hkuc htut cyutli kyuctcup hwicli hrasljutnykfrp hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Cornus alternifolia* is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 3. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta Dye WoodA light to dark-brown dye is obtained from the roots with the addition of vinegar[226]. Wood - heavy, hard, close grained. It is too small to be of commercial value, but is used locally for turnery[82, 229].

dwatta Anthelmintic Antiaphonic Astringent Diaphoretic Febrifuge Ophthalmic Poulitce Stimulant VDGreen osier was employed medicinally by a number of native North American Indian tribes who valued it particularly for its astringent bark which was used both internally and externally to treat diarrhoea, skin problems etc[257]. It is little used in modern herbalism. The dried bark is used as an astringent, diaphoretic and stimulant[213, 257]. The inner bark was boiled and the solution used as an enema[213] and this solution was also used as a tea to reduce fevers, treat influenza, diarrhoea, headaches, voice loss etc[213, 257]. It was used as a wash for the eyes[257]. A compound infusion of the bark and roots has been used to treat childhood diseases such as measles and worms[257]. It has also been used as a wash on areas of the body affected by venereal diseases[257]. A poultice of the powdered bark has been used to treat swellings, blisters etc[257].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Specimen, Woodland garden. An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils and in dry soils. Succeeds in full sun or light shade[188]. Plants are hardy to about -25°C[184]. A fast-growing but short-lived species in the wild[229], it is closely related to *C. controversa*[200]. This species is unusual in having alternate leaves whilst almost all other members of this genus have opposite leaves[182]. Plants have a thin bark and this makes them susceptible to forest fires[229]. There is at least one named form selected for its ornamental value[188]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Attractive flowers or blooms.

#### 4.2.348 *Rhamnus cathartica*

Common Buckthorn

3 tin 7 cyuc 0 kcak 0 tcan 3 dwat 6 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyk hpa7tli flatprikwisslip hpa7tmwatli nyanhjen hjonli

drutta *Rhamnus cathartica* is a deciduous Shrub growing to 6 m (19ft) by 3 m (9ft). See above for USDA hardness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH:

drutta *Euonymus alatus alatus* is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaYoung leaves, boiled[105, 177]. The fruit may be edible[105, 177]. No further details. The fruit is about 8mm in diameter[200]. These reports of edibility should be treated with some caution, see the notes above on toxicity. The flowers are a tea substitute[178].

tcanta Hedge HedgeNone known

dwatta Anodyne Anthelmintic Antiphlogistic Astringent Blood tonic Carminative EmmenagogueAnodyne, ant-helmintic, antiphlogistic, astringent[178]. The stem and branches are alterative, analgesic, anthelmintic, anticoagulant, antipruritic, blood tonic, carminative, emmenagogue and purgative[147, 218]. A decoction is used in the treatment of 'cold' headache, general body aches, pruritis, irregular menstruation and other gynaecological diseases[147]. Plants contain the anticancer compound dulcitol[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[78, 98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Thrives in almost any well-drained soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[1]. A very ornamental plant[1].

#### 4.2.274 *Rudbeckia laciniata*

Cone Flower, Cutleaf coneflower, Green Headed Coneflower 3 tin 7 cyuc 1 kcak 0 tcan 1 dwat 2.4 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Rudbeckia laciniata* is a PERENNIAL growing to 2.4 m (7ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, hoverflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: StemEdible Uses: Edible young stems[105, 155, 161]. Cooked and eaten in the spring for 'good health'[222, 257]. The young stems can be eaten like celery[257]. The stems can also be dried for later use[257]. Some caution is advised, see the notes above on toxicity.

tcanta DyeA green dye is obtained from the flowers[168].

dwatta Carminative PoulitceA tea made from the root (mixed with *Caulophyllum thalictroides*) is used in the treatment of indigestion[222, 257]. A poultice of the flowers (mixed with *Agastache anisatum* and *Solidago* sp.) is applied to burns[222, 257].

propta Seed - sow April in a greenhouse. Only just cover the seed. Germination should take place within 2 weeks, prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer[K]. The seed can also be sown in situ[111]. Division in spring or autumn[111]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Container, Massing. Succeeds in an ordinary medium soil in sun or shade[111]. Requires a moist soil[1]. Prefers a well-drained soil[188]. Tolerates considerable wind exposure without support[K]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. They grow particularly well in long hot late summers[200]. Dormant plants are hardy to about -25°C[187]. Some named forms have been selected for their ornamental value[187]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants can be invasive[200]. Special Features:Attracts birds, North American native, All or parts of this plant are poisonous, Attracts butterflies, Suitable for cut flowers.

#### 4.2.275 *Aster tataricus*

Tartarian Aster

3 tin 7 cyuc 1 kcak 0 tcan 3 dwat 2 m hkuc htut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikwis hpa7tmwatli fyfexre7t hjonli

drutta *Aster tataricus* is a PERENNIAL growing to 2 m (6ft) by 1.2 m (4ft in). See above for USDA hardness. It is hardy to UK zone 3. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant[105, 177]. No more details are given.

tcanta None known

dwatta Antibacterial Antifungal Antitussive Cancer ExpectoantThis species has been used for at least 2,000 years in traditional Chinese medicine. The root contains triterpenes and triterpene saponins, and is a stimulant expectoant herb for the bronchial system, helping to clear infections[238, 279]. It is antibacterial, antifungal, antitussive, expectoant and stimulant[176, 218, 238, 279]. It has an antibacterial action, inhibiting the growth of *Staphylococcus aureus*, *E. coli*, *Bacillus dysenteriae*, *B. typhi*, *Pseudomonas* and *Vibrio Proteus*[176]. The root is taken internally in the treatment of chronic bronchitis and tuberculosis and is often used raw with honey in order to increase the expectoant effect[176, 238]. The root is harvested in the autumn and can be dried for later use[238]. The plant contains the triterpene epifriedelinol, which has shown anticancer activity, and is used as a folk cure for cancer[218, 279].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Basal cuttings in the spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200], but also succeeds in partial shade[238]. Plants are hardy to at least -15°C[238]. Plants can suffer from mildew when growing in dry conditions[238]. This species is cultivated in China as a medicinal herb[238]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

#### 4.2.276 *Veratrum viride*

Indian Poke, American Hellebore

3 tin 7 cyuc 1 kcak 0 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyk hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Veratrum viride* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta One report says that the leaves have been used in soups[257]. The plant is highly toxic, so this use is probably best avoided[K].

tcanta Cleanser Fibre InsecticideThe dried and powdered root is used as an insecticide and a parasiticide[46, 61, 212]. It is also effective against caterpillars and mammals so great caution is advised[1, 19, 20]. The roots have been grated, then added to the laundry water and used to clean clothing[257]. A fibre obtained from the stem is used for weaving wallets etc[99].

dwatta Analgesic Diaphoretic Emetic Expectorant Febrifuge Hypotensive Narcotic SedativeIndian poke is a highly toxic plant that was widely employed medicinally by several native North American Indian tribes who used it mainly externally in the treatment of wounds, pain etc[257]. It is rarely used in modern herbalism, though it is of potential interest because it contains steroidal and other alkaloids and chelidonic acid. Some of these alkaloids lower blood pressure and dilate the peripheral vessels - they have, for example, been used in conventional medicine to treat high blood pressure and rapid heart beat[207, 212, 254]. Any use of this plant should be carried out with great caution and preferably only under the supervision of a qualified practitioner[21]. Even when applied externally to unbroken skin it has been known to cause side-effects[254]. See also the notes above on toxicity The root is analgesic, diaphoretic, emetic, expectorant, febrifuge, narcotic and sedative[4, 21, 257]. It has been used in the treatment of acute cases of pneumonia, peritonitis and threatened apoplexy[244]. A decoction of the root has been used in the treatment of chronic coughs and constipation[257]. A portion of the root has been chewed, or a decoction used, in the treatment of stomach pain[257]. The roots are harvested in the autumn and can be dried for later use[254]. The root has been used to make a skin wash and compresses for bruises, sprains and fractures[257]. The powdered root has been applied as a healing agent to wounds[207] and as a delousing agent[254]. The stems have been scraped and the powder snuffed to induce sneezing[257]. An infusion of the leaves has been used as a wash to treat aches and pains[257]. The plant is used in homeopathic preparations to slow the heart rate[254].

propta Unless stored in damp sand at around 4°c the seed has a short viability[200]. Where possible it is best to sow the seed in a lightly shaded position in the greenhouse as soon as it is ripe[200]. Stored seed needs to be stratified but can be very slow to germinate. Germination can be erratic even for seed sown when it was fresh, it usually takes place within 3 - 12 months at 15°c but can be much longer[200]. The plant produces just one seedleaf in its first year; this forms an over-wintering bulb. It takes up to 10 years for the plant to reach maturity[200]. Sow the seed thinly so there is no need to thin or transplant them, and grow the seedlings on undisturbed in the pot for their first two years of growth. Apply a liquid feed at intervals through the growing season to ensure the plants do not become nutrient deficient. At the end of the second year plant out the dormant plants into individual pots and grow them on in light shade in the greenhouse for a further year or two before planting them out into their permanent positions in late spring or early summer. Division in March/April or in October. Establish the plants in pots in a shaded frame before planting them out[200]. Division is best carried out in the autumn because the plants come into growth very early in the spring[233]. Root cuttings, 6mm long with a bud, rooted in a sandy soil in a cold frame[200].

nwatta Requires a deep fertile moisture retentive humus-rich soil[200]. Succeeds in full sun if the soil does not dry out but prefers a position in semi-shade[200]. Dislikes dry soils, preferring to grow in a bog garden[42]. Grows best in a cool woodland garden or a north facing border[42]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants are long-lived and can be left in the same position for years without attention[233]. In some N.

American Indian tribes, following the death of a chief, all the young aspirants to be chief were given a drink of this toxic plant and the person least affected was deemed to be the strongest and therefore made chief[200].

## 4.2.277 Ilex verticillata

Winterberry, Common winterberry

3 tlin 7 cyuc 1 kcaak 0 tcan 3 dwat 2 m hkuc  
hmmihut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flat-prikkwis hpa7tmwatli nyanhjen hjonli

drutta *Ilex verticillata* is a deciduous Shrub growing to 2 m (6ft) by 1.5 m (5ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the dried and crumbled leaves[161, 177]. It does not contain caffeine[183].

tcanta None known

dwatta Antiseptic Astringent Cathartic Malaria Skin TonicThe bark is antiseptic, astringent, cathartic and tonic[4, 238]. A decoction is used internally in the treatment of diarrhoea, malaria etc, and externally in the treatment of indolent sores and chronic skin disease[4, 238]. The bark contains about 4.8% tannin[4]. It is harvested in the autumn before the first frosts[4]. Another report says that the bark is harvested in the spring and dried for later use[238]. The fruit is cathartic[4].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years[78]. Division in the dormant season.

nwatta Succeeds in most soils so long as they are not water-logged[200]. This species tolerates wetter conditions than most members of the genus[238]. A very ornamental and cold-hardy plant, tolerating temperatures down to about -35°c[184]. A slow-growing tree in the wild[229]. A number of named forms have been selected for their ornamental value[182]. Flowers are produced on the current year's growth[229]. The plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Unlike most members of the genus, this species produces suckers[200]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Dioecious. Male and female plants must be grown if seed is required.

## 4.2.278 Armeria maritima

Sea Thrift, Thrift seapink, California seapink, Interior seapink, Siberian sea thrift

3 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc  
htut cyutli hgatyuctcup hwicli hysihrasljut hpa7tli flatprikkwishsom hpa7tmwatli xre7t hjonli

prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Rootstock WoodThe roots are very disease-resistant and are used as a rootstock for less vigorous species[226]. Wood - finely grained, soft, light, durable, not strong[4, 46, 61, 82, 171, 229, 235]. It weighs 29lb per cubic foot[235]. It takes a very good polish and is used for boxes, crates, flooring, cabinet making etc[4, 46, 61, 171, 229].

dwatta Antiperiodic Aromatic Diaphoretic Laxative Malaria Stimulant TonicA tea made from the bark is antiperiodic, aromatic, mildly diaphoretic, laxative, stimulant, tonic[4, 222]. It has historically been used as a substitute for quinine in the treatment of malaria[222]. An infusion has been used in the treatment of stomach ache and cramps[257]. The bark has been chewed by people trying to break the tobacco habit[222]. A hot infusion of the bark has been snuffed to treat sinus problems and has also been held in the mouth to treat toothaches[257]. The bark is harvested in the autumn and dried for later use[238]. It does not store well so stocks should be renewed annually[238]. A tea made from the fruit is a tonic, used in the treatment of general debility and was formerly esteemed in the treatment of stomach ailments[222].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Border, Firewood, Pest tolerant, Aggressive surface roots possible, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Tolerates limey soils[200] so long as they are deep and rich in humus[188]. The branches are brittle and so a sheltered position is required[200]. Very tolerant of atmospheric pollution[200]. Plants are hardy to about -28°c[200]. A fairly fast-growing tree, it takes about 25 - 30 years before it first produces flowers and lives about 125 - 150 years in the wild[229]. The sub-species *M. acuminata cordata* begins flowering at an earlier age[245]. Good seed crops are produced about every 3 - 5 years[229]. The flowers have a delicate perfume[245]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. Special Features: North American native, Fragrant flowers, Attractive flowers or blooms.

## 4.2.344 Ostrya virginiana

Ironwood, Hophornbeam, Hop Hornbeam American, Hop Hornbeam Eastern

3 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 15 m hkuc  
hmmihut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta *Ostrya virginiana* is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta WoodWood - close-grained, very hard, very strong, durable. It weighs 51lb per cubic foot. The wood is of a very high quality but the tree is not large enough to be used commercially. It is used locally for posts, mallets, tool handles and applications where resistance to wear is essential[11, 46, 61, 82, 103, 226, 227, 229]. A very good fuel, though it is almost impossible to split[226].

dwatta Antirheumatic Astringent Blood tonic Haemostatic PectoralThe bark is astringent, blood tonic and haemostatic[257]. A decoction of the bark is used to bathe sore mus-

cles[257]. An infusion of the bark can be held in the mouth to relieve the pain of toothache[257]. An infusion of the heartwood has been used in the treatment of lung haemorrhages, coughs and colds, catarrh and kidney problems[257]. It is also used as a herbal steam bath in the treatment of rheumatism[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it normally germinates in spring. The germination rate is variable but usually good[78]. 'Green' seed, harvested when the embryo has fully formed but before the outer coat has dried, sown immediately in a cold frame germinates very well. Stored seed requires stratification, 3 months warm then 5 months cold usually works well but germination can take 18 months[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen, Street tree, Woodland garden. An easily grown plant, succeeding in most soils[11].Thrives in any good loam, including chalk[200], it does not demand much light. Prefers a deep open loam. A rather slow-growing tree[227]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Attractive flowers or blooms.

## 4.2.345 Salix fluviatilis

River Willow

3 tlin 7 cyuc 0 kcaak 3 tcan 2 dwat 7 m hkuc  
htut cyutli tcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix fluviatilis* is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Basketry Pioneer Soil stabilization StringThe peeled stems have been used in basket making[257]. The inner bark can be twisted and made into a string[257]. This plant rapidly colonizes sandbanks and wet areas near streams, lakes etc. It is therefore an extremely useful species for stabilizing banks, its network of roots holding the soil securely. It can also be used as a pioneer species to prepare the way for mature woodland. It provides good conditions for other trees to establish and is eventually out-competed by them[229]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe bark has been used in the treatment of certain fevers[257]. The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. It is a fast-growing but short-lived species in the wild[229]. The following notes are based on the general needs of the genus. Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are

grown plant, it is calcifuge and prefers an acid soil with a pH from 4.5 to 6.5, but it tolerates alkaline soils if plenty of leaf mould is added[200]. Grows well in heavy clay soils. Prefers a moist sheltered site with moderately high atmospheric humidity[200]. Succeeds in a semi-shaded bog-garden or in damp woodland, also in garden borders in full or part shade[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage.

### 4.2.341 Abies concolor

Colorado Fir, White fir
3 tin 7 cyuc 0 kcaak 0 tcan 2 dwat 45 m hkuc
pcimhmihtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli hjonli

drutta Abies concolor is an evergreen Tree growing to 45 m (147ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower in April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta Dye WoodaA tan coloured dye can be obtained from the bark[257]. Wood - very light, not strong, coarse grained, soft, not durable. Used mainly for pulp, cases etc[46, 61, 82]. It is sometimes used in framing small houses but is not strong enough to be used in larger buildings[229]. The wood lacks a distinctive odour and so does not impart a flavour to items stored in it. Thus it can be used for making tubs for storing food items[229].

dwatta Antirheumatic Pectoral Poultice TBThe pitch from the trunk has been used as an antiseptic poultice for cuts, wounds etc[257]. An infusion of the pitch, or the bark, has been used in the treatment of TB[257] An infusion of the foliage has been used in a bath for relieving rheumatism[257]. An infusion of the pitch and leaves has been used in the treatment of pulmonary complaints[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown up in a sunny position[80].

nwatta Landscape Uses:Christmas tree, Firewood, Pest tolerant, Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Plants are very shade tolerant but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. Trees succeed on poor dry sites in the wild[155]. Trees are shallow rooted and therefore liable to be wind-blown in exposed sites[155]. Trees grow almost as well in S. Britain as they do in cooler areas of the country[11]. They are at their best in the Perthshire valleys of Scotland and in N.E. England, trees in the south and east of the country tend to be thin in the crown and soon lose their shape. Trees in the west grow better but also lose their shape after a while[11, 185]. New growth is from mid-May to July and trees are virtually never damaged by late frosts or aphids[1, 185]. Most trees of this species that are grown in Britain are in fact the sub-species *A. concolor* lowiana. (Gordon),Lemmon. This form tends to grow better in Britain than the type. There are 2 basic forms of this sub-species, those from the north of the range are

vigorous in height growth whilst the southern form is vigorous in girth growth[185]. They both have a potential for forestry use in Britain[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. A very ornamental tree[1]. The crushed leaves have a strong lemony scent[185]. Special Features:Attractive foliage, North American native, Fragrant foliage, There are no flowers or blooms.

### 4.2.342 Betula ermanii

Gold Birch
3 tin 7 cyuc 0 kcaak 3 tcan 1 dwat 25 m hkuc
hmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flat-priklwis hpa7tmwatli hjonli

drutta Betula ermanii is a deciduous Tree growing to 25 m (82ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta PioneerThe tree colonizes poor soils and cleared woodlands in the wild[11]. This makes it suitable for use as a pioneer species for re-establishing woodlands. It is a quite short-lived species, but grows fairly quickly and creates suitable conditions for more permanent trees to become established. Because its seedlings do not grow well in shady conditions, the birch is eventually out-competed by the other woodland trees.

dwatta Antiseborrheic VulneraryVulnerary. The bark is used to bandage wounds[61].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Succeeds in a well-drained loamy soil in a sheltered position[11, 200]. Grows well in heavy clay soils. Dislikes wet soils[200]. Shade tolerant[200]. A very polymorphic species[58], it hybridizes freely with other members of this genus[50]. The young growth in spring is subject to damage by late frosts[1]. A colonizer of poor soils and cleared woodlands, it tolerates very poor soils[11]. Trees are notably susceptible to honey fungus[200].

### 4.2.343 Magnolia acuminata

Cucumber Tree, Cucumber Magnolia
3 tin 8 cyuc 0 kcaak 0 tcan 3 dwat 20 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Magnolia acuminata is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and

drutta *Armeria maritima* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked[177]. Used for slimming[61]. Root[69]. No more details are given[69].

tcanta A good ground-cover for a sunny position[200]. The cultivar 'Vindictive' has been especially recommended[188] and so has 'Alba'[190]. Plants form a slowly spreading carpet[208].

dwatta UrinarySea thrift is rarely used in herbal medicine, though the dried flowering plant is antibiotic and has been used in the treatment of obesity, some nervous disorders and urinary infections[268]. It cannot be used externally as an antibiotic poultice because it can cause dermatitis or local irritation[268].

propta Seed - pre-soak for 8 hours in warm water and then sow in pots of sandy soil in a cold frame. Germination usually takes place in 2 - 3 weeks at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out in late spring or early summer. Division in spring or after flowering[111]. Fairly easy, large divisions can be planted out straight into their permanent positions whilst it is probably best to pot up smaller divisions and to grow them on in light shade in a cold frame until they are rooting well.

nwatta Landscape Uses:Alpine garden, Border, Container, Massing, Rock garden, Seashore, Specimen. Succeeds in most soils including clay and poor sands[200]. Prefers a well-drained sandy soil with added leaf mould and a sunny position[1, 111, 134]. Requires an acid soil according to one report[24] whilst others say that it dislikes acid soils. Plants are very wind-tolerant and succeed in maritime gardens[233]. Established plants are drought tolerant[190]. Succeeds when grown at the top of a retaining wall or a cavity wall[219]. The plant tolerates light treading[200]. It forms a slowly expanding clump and makes a good edging plant[111]. A good butterfly plant[24, 30]. The flower is a symbol of sympathy, used at funerals[66]. Special Features: North American native, Suitable for cut flowers.

### 4.2.279 Juncus balticus

Baltic Rush
3 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc
hmimhtut cyutli tcuphja7nhs6s hwicli jlutnyik hpa7tli flat-priklwishsom hpa7tmwatli xre7t hjonli

drutta Juncus balticus is a PERENNIAL growing to 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: SeedEdible Uses: Drink SweetenerA sugar forms along the top of the plant. This can be gathered and eaten as candy[257]. Seed[257]. No more details are given but the seed is very small[K]. The stems are used to make a fermented drink[257].

tcanta WeavingThe stems are used in making woven baskets, thatching, weaving mats etc[212, 257]. The basal portions of the stems have been used as a light yellow-brown decoration on baskets[257].

dwatta None known

propta Seed - surface sow in pots in a cold frame in early spring and keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots

and plant them out in the summer if they have grown sufficiently, otherwise in late spring of the following year. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in a moist soil, bog garden or shallow water[1, 200]. Prefers a heavy soil in sun or light shade[200]. Plants can form large clumps and spread aggressively at the roots[200, 212].

### 4.2.280 Berula erecta

Cutleaf Waterparsnip
3 tin 7 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta *Berula erecta* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta The leaves and flowers have been used for food[257].

tcanta None known

dwatta The plant is used externally in the treatment of rheumatism[257]. An infusion of the whole plant can be used as a wash for swellings, rashes and athletes foot infections[257].

propta Seed -

nwatta We have no information on the cultivation needs of this plant but, judging by its native habitats, it is likely to need a moist to wet soil in full sun or light shade[K]. The leaves of this plant are very similar to *Apium nodiflorum*, differing in colour and in the usually greater number of pairs of segments[17].

### 4.2.281 Cimicifuga foetida

Foetid Bugbane
3 tin 7 cyuc 1 kcaak 0 tcan 3 dwat 1.5 m hkuc
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cimicifuga foetida is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105]. Some caution is advised, see the notes above on toxicity.

tcanta RepellentBoth the growing and the dried plant is used as an insect repellent in Siberia[1, 211, 240].

dwatta Analgesic Antibacterial Antiperiodic Antiviral Depurative Diaphoretic Diuretic Febrifuge Sedative Tonic-Foetid bugbane is an anti-infective herb that lowers fevers and reduces pain[238]. The root is analgesic, antibacterial, antiperiodic, antiviral, depurative, diaphoretic, diuretic, febrifuge, sedative, tonic[46, 61, 147, 176, 218, 240]. It is used internally in the treatment of rheumatic complaints, coughs, colds, headaches, gum diseases and feverish infections such as measles[238, 240]. The root is harvested in the autumn and used fresh or dried[238]. Use with caution[176], see the notes above on toxicity.

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Only just cover the seed. It germinates in 1 - 12 months or even longer at 15°c[164]. The seed does not store well and soon loses its viability[200], stored seed may germinate better if given 6 - 8 weeks warm stratification at 15°c and then 8 weeks cold stratification[164]. Prick out the young seedlings into individual pots when they are large

enough to handle and grow them on in a frame for their first winter. Plant out in late spring or early summer[K]. Division in spring or autumn[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist humus rich soil and some shade[1, 200]. Succeeds in ordinary garden soil[1]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. There is some confusion over the name of this species, *C. foetida* (Auct.) is given as a synonym for *C. europaea* Schipez (said to be native to E. Europe) whilst another authority cites *C. europaea* as a synonym of *C. foetida*. It is possible that entries under this species apply also (or instead) to *C. europaea*[50]. A very attractive plant, but the flowers and the green seed pods have an unusual, slightly unpleasant smell[188] that is reminiscent of decaying fish[245].

## 4.2.282 Lysimachia clethroides

Gooseneck Loosestrife, Gooseneck yellow loosestrife, Japanese Loosestrife, Shepherd's Crook  
3 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
hmmhtut cyutli tcup hwicli hrasjltuytkfrp hpa7tli flatprikliwis hpa7tmwattli fyixre7t hjonli

drutta *Lysimachia clethroides* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Fruit LeavesEdible Uses: CondimentLeaves and young shoots - cooked and used as a vegetable[183]. A famine food, they are only used when all else fails[179]. They can also be used as a condiment[46, 61, 183]. Fruits and flowers are said to be edible[177, 183] but no further details are given. The fruit is very small[200].

tcanta None known  
dwatta None known  
propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Specimen, Woodland garden. An easily grown plant, succeeding in a moist loamy soil[1]. Grows well in heavy clay soils. Succeeds in sun or semi-shade[188]. Hardy to about -25°C[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. Succeeds in a woodland or semi-wild garden, it often spreads wildly[200]. Special Features:Not North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers.

## 4.2.283 Lithospermum multiflorum

Manyflowered Gromwell, Manyflowered stoneseed  
3 tin 7 cyuc 1 kcaak 0 tcan 1 dwat m hkuc  
htut cyutli kyuctcup hwicli hrasjltut hpa7tli priklwisslip hpa7tmwattli xre7t hjonli

drutta *Lithospermum multiflorum* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: SeedEdible Uses: The seeds have been used for food[257].

tcanta Dye MiscellanyA purple dye is obtained from the root[155].

dwatta MiscellanyThe root has been used as a 'life medicine' by some native North American Indian tribes[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Requires a warm sunny position in a moderately fertile well-drained calcareous soil[1, 200]. Grows well in dry soils[200].

## 4.2.284 Aconitum napellus

Aconite, Venus' chariot, Wolfsbane Garden, Monk's Hood Garden

3 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hmmhtut cyutli tcup hwicli hrasjltuytkfrp hpa7tli frusflatprikliwisslip hpa7tmwattli xre7t hjonli

drutta *Aconitum napellus* is a PERENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from February to October, in flower from July to August, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Some reports suggest the root is edible if cooked[2, 177], but these should be treated with extreme caution due to the highly toxic nature of the plant[K].

tcanta None known  
dwatta Analgesic Anodyne Antirheumatic Diaphoretic Diuretic Febrifuge Homeopathy Irritant SedativeAconite has been used since ancient times, especially as an antidote to poisoning[244]. Since the entire plant is itself very toxic, however, any use should be under the guidance of a skilled practitioner[4]. All parts of the plant are used medicinally. The root is the most important and this is harvested as soon as the plant dies down in the autumn and is dried before use[4]. The other parts of the plant are less important and are used fresh, being harvested when the plant is coming into flower[4]. The root is analgesic, anodyne, antirheumatic, diaphoretic, diuretic, irritant and sedative[4, 7, 9, 165, 200]. Due to its poisonous nature, it is not normally used internally though it has been used in the treatment of fevers[200]. Externally, it is applied to unbroken skin in the treatment of rheumatism, painful bruises, neuralgia etc[200, 254]. All parts of the plant, except the root, are harvested when the plant is in flower and used to make a homeopathic medicine[232]. This is analgesic and sedative and is used especially in the treatment of fevers, inflammation, bronchitis, neuralgia etc[9, 232].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Landscape Uses:Border, Container, Massing, Woodland garden. Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Plants only thrive in a sunny position if the soil remains moist throughout the growing season[238]. Prefers a calcareous soil. Tolerates a pH in the range 4.5 to 7.5. Plants take 2 - 3 years to flower when grown from seed[244]. Grows well in open woodlands[1, 4]. The flowers are very attractive to bees[244]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. Although the plant is a perennial, individual roots only live for one year and die after flowering. Each root produces a number of 'daughter' roots before it dies and these can be used for propagating the plant[4]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. An aggregate species which is divided

clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked and used as a pot-herb[2, 105]. A famine food, used when all else fails, and I would rather give it a miss even then[K]! See the notes above on toxicity. Root - must be dried beforehand and thoroughly cooked[118]. Personally, I would rather give this one a miss[K], see the notes above on toxicity.

tcanta None known  
dwatta Analgesic RubefacientThe entire plant is analgesic and rubefacient[257]. A poultice of the chewed leaves has been used in the treatment of sores, muscular aches and rheumatic pains[257]. Some caution is advised in the use of this plant, see the notes above on toxicity.

propta Seed - sow spring in a cold frame. A very common weed, it doesn't really need any help from us. Division in spring. Very easy, though probably totally unnecessary, larger divisions can be planted out direct into their permanent positions.

nwatta Landscape Uses:Ground cover, Woodland garden. Prefers a moist loamy soil on the heavy side. A rampantly spreading weed of grassland, few gardeners would want to introduce it to their land[K]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features:Attractive foliage, North American native, Invasive, Naturalizing, Wetlands plant, Extended bloom season in Zones 9A and above. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

## 4.2.339 Panax quinquefolius

American Ginseng  
3 tin 7 cyuc 1 kcaak 0 tcan 3 dwat 0.3 m hkuc  
pcimhmim cyutli tcup hwicli hrasjltuytkfrp hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta *Panax quinquefolius* is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: TeaA tea is made from the leaves and the roots[105, 177, 183]. The aromatic root is candied and used as a masticatory[183].

tcanta None known  
dwatta Adaptogen Cardiotoxic Demulcent Sedative Sialogogue Stimulant StomachicThis N. American species of ginseng is said to have similar properties to the Oriental ginseng, *P. ginseng*, though it is said to have a milder action and is more likely to be prescribed for younger patients[238, 254]. It is cultivated in some areas of America as a medicinal crop and is also often harvested from the wild[238]. The root is said to be adaptogen, cardiotoxic, demulcent, panacea, sedative, sialogogue, stimulant and stomachic[21, 35, 46, 147, 165, 176, 222]. It is used in the treatment of chronic cough, low-grade fever, spontaneous or night sweating and fatigue due to chronic consumptive disease[176]. When taken over an extended period it is said to increase mental efficiency and physical performance whilst helping the body adapt to high or low temperatures and stress[222]. Some caution is advised, though, because large doses are said to raise blood pressure[222]. The root is harvested in the autumn and dried for later use[254]. The following notes are the list of uses for *P. ginseng*. Ginseng has a history of herbal use going back over 5,000 years[238]. It is one of the most highly regarded of herbal medicines in the Orient, where it has gained an almost magical reputation for being able to promote health, general body vigour and also to prolong life[218]. The root is adaptogen, alterative, carminative, demulcent, emetic, expectorant, stimulant and tonic[165, 176, 178, 218]. It both stimulates and relaxes the nervous system, encourages the secretion of hormones, improves stamina, lowers blood sugar and cholesterol levels

and increases resistance to disease[238]. It is used internally in the treatment of debility associated with old age or illness, lack of appetite, insomnia, stress, shock and chronic illness[238]. Ginseng is not normally prescribed for pregnant women, or for patients under the age of 40, or those with depression, acute anxiety or acute inflammatory disease[238]. It is normally only taken for a period of 3 weeks[238]. Excess can cause headaches, restlessness, raised blood pressure and other side effects, especially if it is taken with caffeine, alcohol, turnips and bitter or spicy foods[238]. The roots are harvested in the autumn, preferably from plants 6 - 7 years old, and can be used fresh or dried[238]. A dose of 10ug/ml of ginseng saponins has been shown to be significantly radio-protective when it is administered prior to gamma-irradiation[218]. The leaf is emetic and expectorant[218].

propta Seed - sow in a shady position in a cold frame preferably as soon as it is ripe, otherwise as soon as the seed is obtained. It can be very slow and erratic to germinate. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a shady position in the greenhouse or frame for at least their first winter. Make sure the pots are deep enough to accommodate the roots. Plant out into their permanent positions in late summer. Division in spring.

nwatta Requires a deep moist humus rich soil in a shady position in a woodland[200]. Requires deep shade, growing well on north-facing slopes and in woodland[4, 14, 20]. Often grown as a medicinal plant[4, 57], though considered to be inferior to Korean ginseng, *P. ginseng*[200]. It is exported from N. America, mainly to Hong Kong[207]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of 'heat days' experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is fleshy. Thick or swollen - fibrous or tap root [1-2].

## 4.2.340 Athyrium niponicum

Painted Fern, Japanese Silver Painted Fern  
3 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
pcimhmim cyutli tcuphja7n hwicli hrasjltuytkfrp hpa7tli frusflatprikliwis hpa7tmwattli hjonli

drutta *Athyrium niponicum* is a FERN growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: Very young fronds (croziers) - boiled[177]. Some caution is advised. See the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Spores - surface sow in a pot of sterile compost in a shady part of the greenhouse and keep moist, this is most easily done by putting the pot in a plastic bag. Pot up small clumps of the plants when they are large enough to handle and keep them moist until they are established. Plant out in late spring of the following year. Division in spring as plants come into growth. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Alpine garden, Border, Container, Massing, Rock garden, Woodland garden. An easily

1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.335 *Convallaria keiskei*

Lily Of The Valley

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmhmhtut cyutli kyuctcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjre7t hjonli

drutta *Convallaria keiskei* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

kcakta Edible Parts: Flowers Leaves Edible Uses: Tea The whole plant is cooked as a potherb or put in milk soup [177, 183]. Caution is advised, see the notes above on toxicity. The flowers and flower buds are preserved in salt or mixed with leaf tea and drunk [177, 183].

tcanta Plants can be grown as a ground cover in woodland shade or in a shrubbery [200].

dwatta None known

propta Seed - best sown as soon as it is ripe, otherwise in late winter, in a cold frame [164]. Germination, particularly of stored seed can be very slow, taking 2 - 12 months or more at 15°C [164]. Sow the seed thinly so that the seedlings can be allowed to grow on undisturbed in the pot for their first year. Apply a liquid feed during the growing season to ensure that the seedlings are well fed. Divide the young plants into individual pots when they die down in late summer and grow them on in pots in a shady position in a cold frame for at least another year before planting them out into their permanent positions when they are dormant [K]. Division in September [11]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in almost any situation, including the dense dry shade of large trees [1, 24]. Prefers a position in semi-shade in a moderately fertile well-drained moist woodland soil [200]. Grows well in heavy clay soils. Plants are hardy to -20°C or lower [200]. A good bee plant [4]. A very ornamental plant, though it can become very invasive once it is established [200]. Plants seem to be immune to the predations of rabbits [233].

### 4.2.336 *Liatris punctata*

Snakeroot, Dotted blazing star, Mexican blazing star, Nebraska blazing star

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Liatris punctata* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Root Edible Uses: Root - raw or cooked [46, 61, 105, 161, 212, 257]. A sweet flavour when harvested in the spring and baked [257]. Eating the root is said to improve the appetite [257].

tcanta None known

dwatta Antipruritic Diuretic Poulitice Stomachic An infusion of the roots has been used in the treatment of stomach aches, bloody urine and women's bladder complaints [257]. The root has been chewed and the juice swallowed in the treatment of swollen testes [257]. A decoction of the roots is used as a wash for itching skin complaints [238, 257]. A poultice of the boiled roots is applied to swellings [257].

propta Seed - best sown as soon as it is ripe in autumn in a greenhouse [200]. Sow stored seed as soon as possible in the year in a greenhouse. Prick out the seedlings into individual pots when they are large enough to handle and grow the plants on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring [1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings taken in spring as growth commences. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Grows well in a moderately good light soil [200]. Tolerates poor soils [200]. Plants are prone to rot overwinter in wet soils [200]. A good bee plant. Rodents are very fond of the tubers so the plants may require some protection [200].

### 4.2.337 *Geum alepicum*

Yellow Avens

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Geum alepicum* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Edible Uses: Young leaves - cooked [46, 177]. Used in spring.

tcanta None known

dwatta Anodyne Astringent Diaphoretic Febrifuge Skin The plant is anodyne [218]. It is used in the treatment of sores, wounds and skin diseases [218]. The root is astringent, diaphoretic and febrifuge [257]. A decoction has been used in the treatment of diarrhoea, fevers, children's coughs, sore teeth and sore throats [257].

propta Seed - sow spring or autumn in a cold frame [200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer' Division in spring or autumn. This should be done every 3 - 4 years in order to maintain the vigour of the plant [200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any moderately good garden soil that is well-drained [1]. Prefers a soil rich in organic matter [200]. Hybridizes freely with other members of this genus [200].

### 4.2.338 *Ranunculus repens*

Creeping Buttercup, Prairie Double-flowered Buttercup, Water Buttercup, Creeping Buttercup

3 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ranunculus repens* is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. It is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy

by some botanists into many species [17, 76]. Special Features: Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers.

### 4.2.285 *Lonicera morrowii*

Morrow's honeysuckle

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lonicera morrowii* is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit Edible Uses: Fruit - raw [105, 179]. There is a question mark as to whether this fruit might be poisonous, or perhaps cathartic and emetic [105, 179]. The fruit is about 7mm in diameter [200].

tcanta None known

dwatta Cathartic Emetic The fruit is cathartic and emetic [179].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification [113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage [78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage [78]. Layering in autumn [200].

nwatta An easily grown plant, succeeding in any fertile soil, and preferring a good moist soil in a sunny position [11, 200]. There is at least one named variety, developed for its ornamental value. 'Guldperle' is from Denmark and has yellow berries [182].

### 4.2.286 *Coreopsis verticillata*

Whorled tickseed

3 tlin 9 cyuc 1 kcaak 3 tcan 1 dwat 1 m hkuc htut cyutli hgatyuctcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli hjonli

drutta *Coreopsis verticillata* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Edible Uses: Edible flowers [318-1].

tcanta Soil stabilization Groundcover. A good medium to high density fast growing groundcover [1-2]. Erosion Control. Ornamental: Good in flower beds, borders, mass plantings, entrance ways, foundations, raised planters, and naturalized sunny areas. A good plant for areas with poor, dry soils. Container Garden. Cut Flower. Insectory: Long flowering period attracts butterflies. [318-1].

dwatta Diuretic Diuretic [318-1].

propta Propagation is by seed or division of the rhizomes.

nwatta A hardy herbaceous rhizomatous perennial. It can tolerate drought, poor soil, extreme heat, and neglect. Life Span: Short-Lived Perennial. Stand Persistence: Long. Form: Clump. Texture: Fine. Sun: Full Sun. Soil Type: Sandy, Loamy, Silty. Soil Moisture: Moderate, Dry. Soil pH: 6.5 - 7.5. Root Type: Rhizome. Seasonal Interest: Summer-Fall. Notes: Spreads via rhizome, forms a dense clump. Seeds resemble ticks, hence the name. Cultivars available. The following notable cultivars have all gained the Royal Horticultural Society's Award of Garden Merit: 'Grandiflora' - taller than other cultivars, with slightly larger flowers. 'Moonbeam' - pale, sulphur-yellow flowers, slightly

shorter growth. 'Zagreb' - shorter than the species, bright yellow flowers. Flower Color: Yellow. Drought: Tolerant. Flood: Sensitive. Cold Injury: Infrequent. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer. Bloom Time: Summer - Late Fall. Fruit Time: Summer - Fall [318-1]. Tends to sprawl, particularly if grown in moist and/or fertile soils. Crown rot may occur if grown in moist, poorly drained soils. Plants may be sheared in mid to late summer to promote a fall rebloom and to remove any sprawling or unkempt foliage. Species plants can spread somewhat aggressively in the garden by both rhizomes and self-seeding [368-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 4.2.287 *Artemisia sacrorum*

Russian Wormwood

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli hgatyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Artemisia sacrorum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Edible Uses: One report says that the plant is edible but gives no more details [177].

tcanta None known

dwatta None known

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out [200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn [200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position [1, 200]. Established plants are drought tolerant [200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil [245]. This species is closely related to *Artemisia gmelinii* and is often confused with that species [266]. We are not sure if this plant is annual, biennial or perennial, since various reports differ. Members of this genus are rarely if ever troubled by browsing deer [233].

### 4.2.288 *Aconitum lycoctonum vulparia*

Wolfbane

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Aconitum lycoctonum vulparia* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Some reports suggest the root is edible if cooked[2, 105], but these should be treated with extreme caution due to the highly toxic nature of the plant[K].

tcanta None known

dwatta Analgesic Anodyne Diaphoretic Diuretic Irritant SedativeThe root is analgesic, anodyne, diaphoretic, diuretic, irritant, sedative[4, 7, 9, 165]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. An aggregate species which is divided by some botanists into many species.

## 4.2.289 Artemisia gmelinii

Russian Wormwood, Gmelin's wormwood

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli hgatkycucup hwicli hyishrasjlutnyik hpa7tli flat-prikklwis hpa7tmwatli xre7t hjonli

drutta Artemisia gmelinii is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: One report says that the plant is edible but gives no more details[177].

tcanta The plant yields 1% essential oil, which contains 19% essential oil, 6% camphor[240].

dwatta HepaticThe leaf and stem are used in Korea to treat hepatitis, hyperlipaemia and infected cholecystitis[279]. The plant contains flavonoids, sesquiterpenes and other bio-active constituents, though no bio-activities have been recorded scientifically[279].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. This species is closely related to *A. sacrorum* and often confused with that species[266]. We are not sure if this plant is annual, biennial or perennial, since various reports differ. Members of this genus are rarely if ever troubled by browsing deer[233].

## 4.2.290 Hypericum ascyron

Great Saint John's Wort

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyfxre7t hjonli

drutta Hypericum ascyron is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves, shoot tips and flowering buds - cooked[105, 177]. The leaves are a tea substitute[177].

tcanta None known

dwatta Depurative Emmenagogue Febrifuge Poultrice Stings VD VulneraryThe fruit is emmenagogue and is also used to treat skin complaints and gonorrhoea[218]. The whole plant is depurative, febrifuge, poultrice and vulnerary[147, 218]. A decoction is used in the treatment of boils and abscesses, headaches and stomach ache and vomiting[147]. The root is considered to be specific for use in treating the first stages of consumption[257]. A powder made from the boiled root has been applied as a poultice to draw the poison out of a snake bite[257].

propta Seed - sow spring in a greenhouse and only just cover the seed. The seed usually germinates in 1 - 3 months at 10°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any reasonably good well-drained but moisture retentive soil[1]. Succeeds in sun or semi-shade but flowers better in a sunny position[200].

## 4.2.291 Galium mollugo

Hedge Bedstraw, False baby's breath

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat m hkuc hmim cyutli kyucucup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyfxre7t hjonli

drutta Galium mollugo is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[62].

tcanta DyeA red dye is obtained from the root[100, 168]. It is very fiddly to utilize[169]. A good ground cover for growing in cool shade under shrubs or in the woodland garden[200].

dwatta Antispasmodic Epilepsy Lithontripic Vulnerary-The plant is lithontripic and vulnerary. It is also used in the treatment of epilepsy and hysteria[4]. Both Asperuloside (a terpenoid) and Coumarin (a benzopyrone) occur in some species of Galium. Asperuloside can be converted into prostaglandins (hormone-like compounds that stimulate the uterus and affect blood vessels), making the genus of great interest to the pharmaceutical industry[238].

propta Seed - best sown in situ as soon as it is ripe in late summer[200]. The seed can also be sown in spring though it may be very slow to germinate[200]. This plant does not really need any help to reproduce itself. Division in spring or throughout the growing season if the plants are kept well watered[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a loose moist leafy soil in some shade[200]. Tolerates dry soils but the leaves quickly become

Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200]. Thrives in light shade or in open sunny positions[14]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

## 4.2.332 Bromus thominii

Soft Brome

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.8 m hkuc hmimhtut cyutli kyucucup hwicli hrasjlutnyik hpa7tli flat-prikklwis hpa7tmwatli fyfxre7t hjonli

drutta Bromus thominii is a BIENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind, Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Seed - cooked[257]. The seed can be dried, ground into a powder then mixed with water and eaten as a gruel[257]. The seed is small and fiddly to utilize[K].

tcanta None known

dwatta None known

propta Seed - sow spring or autumn in situ and only just cover. Germination should take place within 2 weeks. If seed is in short supply it can be surface sown in a cold frame in early spring. When large enough to handle, prick out the seedlings into individual pots and plant them out in early summer. Division in spring. Large clumps can be planted out direct into their permanent positions whilst it is best to pot up smaller clumps and grow them on in a cold frame until they are ready to be planted out.

nwatta Succeeds in a sunny position in most well-drained soils[138, 200]. The plant produces open, wind-pollinated flowers and also cleistogamous flowers - these do not open and are self-fertilized[17]. The report regarding edibility in [257] refers to *B. hordaceus* L. [17] gives this species as a synonym for *B. thomasii*, but only the section *Holmberg*.

## 4.2.333 Veronica chamaedrys

Germander Speedwell

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli kyucucup hwicli hrasjlutnyik hpa7tli flat-prikklwis hpa7tmwatli fyfxre7t hjonli

drutta Veronica chamaedrys is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from March to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaThe leaves are a tea substitute[177, 183].

tcanta None known

dwatta Blood purifier Skin VulneraryThe herb is a blood purifier and vulnerary[4]. It is applied externally to skin diseases and is said to be an efficacious treatment for the itch[4]. Internally, an infusion of the leaves once had a good reputation in the treatment of coughs, asthma, catarrh etc[4].

propta Seed - sow autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have

sufficient quantity, the seed can be sown in situ in the autumn or the spring. Division in autumn or spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200]. A good bee plant[24]. A common garden weed, it grows well in a lawn[200] and can be grown in the spring meadow[24]. It is also a good plant for the flower border[1].

## 4.2.334 Athyrium filix

Lady Fern, Common ladyfern, Subarctic ladyfern, Asplenium ladyfern, Southern Lady Fern, Tatting Fer  
3 tlin 8 cyuc 1 kcaak 2 tcan 2 dwat 0.6 m hkuc pchimmim cyutli tcup hwicli hrasjlutnyikfrip hpa7tli frusflat-prikklwis hpa7tmwatli hjonli

drutta Athyrium filix-femina is a deciduous Fern growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. The seeds ripen from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots, harvested before they have fully unfolded, can be eaten cooked[256]. They must not be eaten raw - see the notes above on toxicity[172]. Used in spring, they are a bitter emergency food[172]. Rhizome - peeled and slow-baked[118, 257]. Reports that the root of this plant were eaten by native North American Indians are likely to be mistaken, it was probably *Dryopteris* expansa that was used[256].

tcanta A good ground cover plant[200], forming a slowly spreading clump[208]. The cultivar 'Minor' has a denser habit and spreads more freely, making a better cover[208].

dwatta Anthelmintic Diuretic Poultrice Women's complaintsA tea of the boiled stems has been used to relieve labour pains[213, 222, 257]. The young unfurled fronds have been eaten to treat internal ailments such as cancer of the womb[257]. The roots are anthelmintic and diuretic[4, 222]. A tea of the boiled roots has been used to treat general body pains[213, 257], to stop breast pains caused by childbirth and to induce milk flow in caked breasts[222, 257]. The dried powdered root has been applied externally to heal sores[222, 257]. A liquid extract of the root is an effective anthelmintic, though it is less powerful than the male fern, *Dryopteris filix-mas*[4].

propta Spores - surface sow in a pot of sterile compost in a shady part of the greenhouse and keep moist, this is most easily done by putting the pot in a plastic bag. Pot up small clumps of the plants when they are large enough to handle and keep them moist until they are established. Plant out in late spring of the following year. Division in spring as plants come into growth. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Border, Container, Foundation, Ground cover, Massing, Woodland garden. An easily grown plant[4], it is calcifuge and prefers an acid soil with a pH from 4.5 to 6.5, but it tolerates alkaline soils if plenty of leaf mould is added[200]. Grows well in heavy clay soils. Prefers a moist sheltered site with moderately high atmospheric humidity[200]. A very ornamental [1] and polymorphic species, there are many named varieties selected for their ornamental value[187]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Naturalizing, Wetlands plant. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from



into individual pots once they have died down in late summer. Grow them on in pots for another year or more until large enough to plant out[K]. Division as new growth commences in the spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a cool shady moist but not wet position[1, 187]. Plants tolerate warm summers only if the soil remains moist[200]. A mat forming plant, it can be invasive in good conditions[200]. The flowers are sweetly scented[245]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.329 Anemone narcissiflora

Narcissus-Flowered Anemone, Narcissus anemone 3 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikklwis hpa7tmwatli fyfjxre7t hjonli

drutta Anemone narcissiflora is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[46, 61, 177]. The leaves, together with other salad greens and oil, were beaten to a creamy consistency and frozen into an 'ice cream' [257]. Some caution is advised, see the notes above on toxicity. Root - raw[177]. The upper root ends have been used for food[257]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta HaemostaticThe plant has been used as an anti-haemorrhagic[270].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down. This plant is very slow to increase[187].

nwatta Succeeds in ordinary garden soil but prefers a rich sandy loam[1] and full sun[200]. Succeeds in full sun or part shade[187]. Plants succeed in maritime gardens[233]. Hardy to about -20°C[187]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. A very ornamental[1] and highly polymorphic plant[50, 187, 270]. There are a large number of sub-species[270].

### 4.2.330 Artemisia stelleriana

Beach Wormwood, Oldwoman, Dusty Miller 3 tin 9 cyuc 1 kcaak 3 tcan 0 dwat 0.5 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Artemisia stelleriana is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year; in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It

cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Edible Uses: CondimentThe leaves are used for flavouring rice dumplings[177, 179, 183].

tcanta Plants can be grown as ground cover in a sunny position[197], they are of sprawling habit[208]. Provides shelter for beneficial invertebrates: insects and other arthropods. A specialist nectary plant [1-2]. Landscape Uses: Border, Ground cover, Massing, Seashore, Specimen. Some named forms have been selected for their ornamental value[187]. Special Features: Attractive foliage, North American native, Suitable for dried flowers.

dwatta None known  
propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Requires a well-drained sandy soil and a sunny position[187]. Established plants are drought tolerant[190]. Grows well in maritime areas and in cold gardens[208, 233]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.331 Veronica officinalis

Common Speedwell 3 tin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyk hpa7tli flatprikklwis hpa7tmwatli fyfjxre7t hjonli

drutta Veronica officinalis is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: TeaA bitter tangy tea is made from the fresh flowering herb or the dried leaves[2, 21, 46, 183]. The dried leaves can be added to tea blends[238].

tcanta None known  
dwatta Alterative Antipruritic Antirheumatic Astringent Diuretic Expectorant Stomachic TonicThe leaves and roots are alterative, astringent, mildly diuretic, mildly expectorant, stomachic and tonic[4, 9, 14, 21, 222]. They have been employed in the treatment of pectoral and nephritic complaints, haemorrhages, skin diseases and the treatment of wounds[4], though the plant is considered to be obsolete in modern herbalism[238]. The leaves are harvested in the summer and dried for later use[9].

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient quantity, the seed can be sown in situ in the autumn or the spring. Division in autumn or spring[200].

scorched when growing in full sun[200]. This species does not thrive in a hot climate[200]. A polymorphic species[17].

### 4.2.292 Echinacea purpurea

Echinacea, Eastern purple coneflower, Hedge Coneflower, Black Sampson, Purple Coneflower 3 tin 10 cyuc 1 kcaak 2 tcan 5 dwat 1.2 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Echinacea purpurea is a PERENNIAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: LeavesEdible Uses: Leaves[160]. No more details are given.

tcanta Nectar for insects, Deer resistant foliage.  
dwatta Adaptogen Alterative Antiseptic Aphrodisiac Depurative Digestive Sialagogue UrinaryEchinacea is considered to be the most effective detoxicant in Western herbal medicine for the circulatory, lymphatic and respiratory systems[238, 254]. Its use has also been adopted by Ayurvedic medicine[238]. Plants in this genus were probably the most frequently used of N. American Indian herbal remedies. They had a very wide range of applications and many of these uses have been confirmed by modern science. This species is the most easily cultivated of the genus and so has been more generally adopted for its medicinal uses[238]. The plant has a general stimulatory effect on the immune system and is widely used in modern herbal treatments[222]. In Germany over 200 pharmaceutical preparations are made from Echinacea[222]. There has been some doubt over the ability of the body to absorb the medicinally active ingredients orally (intravenous injections being considered the only effective way to administer the plant), but recent research has demonstrated significant absorption from orally administered applications[222]. The roots and the whole plant are considered particularly beneficial in the treatment of sores, wounds, burns etc, possessing cortisone-like and antibacterial activity[222]. The plant was used by N. American Indians as a universal application to treat the bites and stings of all types of insects[213]. An infusion of the plant was also used to treat snakebites[213]. The root is adaptogen, alterative, antiseptic, aphrodisiac, depurative, diaphoretic, digestive, sialagogue[4, 21, 61, 160, 165, 213]. It is harvested in the autumn and dried for later use[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Echinacea for common cold, cough and bronchitis, fevers and cold, urinary tract infections, inflammation of the mouth and pharynx, increase resistance to infection, wounds and burns (see [302] for critics of commission E).

propta Seed - sow March/April in a greenhouse and only just cover the seed[175, K]. Diurnal temperature fluctuations aid germination[175]. The seed usually germinates in 10 - 21 days at 25°C[175]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse for the first summer. Plant them out in the late spring or early summer of the following year and give them some protection from slugs at least until they are established[K]. Division in spring or autumn[111]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings, October in a frame[200].

nwatta Landscape Uses:Border;Container, Massing, Seashore, Specimen. Prefers a deep rich loam with plenty of leafmold[1] and a sunny position[175]. Succeeds in dry soils and tolerates drought once it is established[160]. Prefers a good light soil[187]. A very ornamental plant, there are some named varieties[187]. Slugs love this plant[K]. Special Features:Attracts birds, North American native, Edible, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form

- tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 4.2.293 Erigeron annuus

Annual Fleabane, Eastern daisy fleabane 3 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikklwis hpa7tmwatli fyfjxre7t hjonli

drutta Erigeron annuus is a ANNUAL/PERENNIAL growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young plant - boiled[105, 177].

tcanta None known  
dwatta None known  
propta Seed - sow spring in situ. The seed usually germinates within four weeks.

nwatta Landscape Uses:Border, Container, Rock garden, Seashore, Specimen. Prefers a moderately fertile well-drained soil in a sunny position[200]. A polymorphic species[50]. A self-fertile plant, producing seed apomictically[50]. Very few members of this genus will hybridise with other members of the genus[274]. Special Features:North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers.

### 4.2.294 Anaphalis margaritacea

Pearly Everlasting, Western pearly everlasting 3 tin 7 cyuc 1 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikklwis hpa7tmwatli vnyanhjen hjonli

drutta Anaphalis margaritacea is a PERENNIAL growing to 0.9 m (3ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in August, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta Dye IntenseYellow to gold, also green and brown dyes can be obtained from the flowers, stems and leaves combined[168]. The leaves, flowers and stems have been used as an incense, especially in baby cradles[257].

dwatta Anodyne Antiseptic Astringent Dysentery Expectorant Poulitice SedativePearly everlasting was often employed medicinally by native North American Indian tribes who used it in the treatment of a range of ailments[257]. It is little used in modern herbalism. The whole plant is anodyne, antiseptic, astringent, expectorant and sedative[4, 61, 168, 222]. Used internally, it is a good remedy for diarrhoea, dysentery and pulmonary affections[4]. A poultice of the flowers or the whole plant is applied to burns, sores, ulcers, bruises, swellings and rheumatic joints[4, 222, 257]. An infusion of the plant is steamed and inhaled in the treatment of headaches[257]. a cooled infusion of the roots and shots has been used as a laxative and emetic to treat 'poison stomach'[257].

propta Seed - sow spring in a cold frame[1, 133]. The seed is best sown when it is ripe in the autumn. It usually germinates in 4 - 8 weeks at 15°C[133]. When large enough to

handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is very easy at almost any time of the year, the divisions can be planted straight into their permanent positions if required.

nwatta Prefers a light well-drained soil and a sunny position[1, 133]. Requires a moist soil[208]. Succeeds in most soils[200], including poor ones[1], and also in light shade[200]. Succeeds in the shade of buildings, but not of trees[233]. Plants are hardy to about -25°c[187]. The flowering stems can be dried and used as everlasting flowers[212]. Plants seem to be immune to the predations of rabbits[233]. Dioecious. Male and female plants must be grown if seed is required.

### 4.2.295 Verbena hastata

American Blue Vervain, Swamp verbena
3 tin 7 cyuc 1 kcak 0 tcan 2 dwat 1.5 m hkuc
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Verbena hastata is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: TeaSeed - cooked[257]. The seed can be roasted and ground into a powder or used whole as a piñole[105, 161, 183, 257]. Pleasantly bitter, some of this bitterness can be removed by leeching the flour[183]. The leaves are used as a tea substitute[161, 183, 257].

tcanta None known
dwatta Antiperiodic Diaphoretic Emetic Expectorant Tonic Vermifuge VulneraryThe leaves and roots are antiperiodic, diaphoretic, emetic, expectorant, tonic, vermifuge and vulnerary[4, 21, 46, 222]. The roots are more active than the leaves[222]. The plant is used in the treatment of stomach aches, gravel, worms and scrofula[4, 257]. An infusion of the roots, leaves or seeds has been used in the early stages of fevers[257]. A snuff made from the dried flowers has been used to treat nose bleeds[257].

propta Seed - sow early spring in a greenhouse or cold frame and only just cover the seed[1]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Basal cuttings in early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any moderately fertile well-drained but moisture retentive soil in a sunny position[1, 200]. Plants are hardy to about -20°c[187].

### 4.2.296 Saussurea pulchella

3 tin 7 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Saussurea pulchella is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known
dwatta None known
propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in the spring. Surface sow, or only just cover the seed, and make sure that the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring after the last expected frosts. Division in spring might be possible.

nwatta Succeeds in most soils in a sunny well-drained position[1].

### 4.2.297 Verbascum thapsus

Great Mullein, Common mullein, Aaron’s Rod, Flannel Plant, Hag Taper, Mullein, Torchcs, Velvet Plant
3 tin 8 cyuc 1 kcak 4 tcan 3 dwat 1.8 m hkuc
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli fyifxre7t hjonli

drutta Verbascum thapsus is a BIENNIAL growing to 1.8 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Edible Uses: TeaAn aromatic, slightly bitter tea can be made by infusing the dried leaves in boiling water for 5 - 10 minutes[183]. A sweeter tea can be made by infusing the fresh or dried flowers[183].

tcanta Dye Insecticide Insulation Lighting Tinder Wick-Landscape Uses: Border - a very ornamental plant. A yellow dye is obtained from the flowers by boiling them in water[4]. When used with dilute sulphuric acid they produce a rather permanent green dye, this becomes brown with the addition of alkalis[4, 13, 100, 168]. An infusion of the flowers is sometimes used to dye the hair a golden colour[4, 200]. The flowering stems can be dipped in wax and used as torches[53, 106, 124]. The down on the leaves and stems makes an excellent tinder when quite dry[4, 53, 115]. It is also used as an insulation in shoes to keep the feet warm[4, 200] and to make wicks for candle[1, 4, 13, 100, 115, 124]. One report says that the leaves contain rotenone, though it does not say in what quantity[222]. Rotenone is used as an insecticide[K]. Special Features:Attracts birds, Attractive foliage, Edible, Not North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for dried flowers, Attractive flowers or blooms. Dynamic accumulator.

dwatta Anodyne Antiseptic Astringent Demulcent Emollient Expectorant Homeopathy Narcotic Odontalgic VulneraryGreat mullein is a commonly used domestic herbal remedy, valued for its efficacy in the treatment of pectoral complaints[4]. It acts by reducing the formation of mucus and stimulating the coughing up of phlegm, and is a specific treatment for tracheitis and bronchitis[254]. The leaves and the flowers are anodyne, anti-inflammatory, antiseptic, antispasmodic, astringent, demulcent, diuretic, emollient, expectorant and vulnerary[4, 7, 13, 21, 46, 53, 165, 222]. An infusion is taken internally in the treatment of a wide range of chest complaints and also to treat diarrhoea[4, 238]. The plant combines well with other expectorants such as coltsfoot (Tussilago farfara) and thyme (Thymus vulgaris)[254]. Externally, a poultice of the leaves is a good healer of wounds and is also applied to ulcers, tumours and piles[4, 222, 254]. Any preparation made from the leaves needs to be carefully strained in order to remove the small hairs which can be an irritant[7]. The plant is harvested when in flower and is dried for later use[238]. An infusion of the flowers in olive oil is used as earache drops, or as a local application in the treatment of piles and other mucous membrane inflammations[4, 222, 238]. This infusion is also strongly bactericidal[4]. A decoction of the roots is said to alleviate toothache and also relieve cramps and convulsions[4]. The juice of the plant and

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[92, 161].

tcanta None known
dwatta None known
propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°c[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. One report says that the bulbs must be planted into their permanent positions immediately[1], whilst another says that they can be stored overwinter and replanted in the spring[138]. Stem bulbils, harvested from the stems after flowering[200]. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry over winter[1, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1]. Another report says that the plant requires plenty of moisture when in growth, but very dry conditions after it has flowered[245]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. The plants should not be crowded by other plants[214]. Bulbs have succeeded in a cold frame with the cover removed from March to October[214]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Another report says that they should be replanted immediately[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. The flowers are sweetly scented[245]. Hand pollination is necessary if seed is required.

### 4.2.326 Veronica spuria

bastard speedwell
3 tin 7 cyuc 1 kcak 0 tcan 0 dwat 0.5 m hkuc
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Veronica spuria is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - raw or cooked. A famine food, they are only used when all else fails[179].

tcanta None known
dwatta None known
propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient quantity the seed can be sown outdoors in situ in the autumn or the spring. Division in autumn or spring[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200].

### 4.2.327 Eriogonum corymbosum

Crispleaf Buckwheat, Las Vegas wild buckwheat
3 tin 7 cyuc 1 kcak 0 tcan 1 dwat 0.3 m hkuc

htut cyutli kyuctcup hwicli hyishrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Eriogonum corymbosum is an evergreen Shrub growing to 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - cooked[46, 61, 161]. The leaves can be boiled, mixed with water and cornmeal and baked into a bread[257]. The stems are boiled, pressed into cakes then dried and eaten with salt[270].

tcanta None known

dwatta A decoction of the leaves, taken three times a day, is a remedy for headache[257]. The var glutinosum was most probably used[270]. This variety was also used as a treatment for TB, or at least to treat coughs[270].

propta Seed - best sown as soon as it is ripe in the autumn in a sandy compost in a greenhouse. Sow stored seed in early spring in a warm greenhouse[1]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Division in early spring[1]. This has to be done with care because the plant resents root disturbance[200]. Try to obtain divisions from around the edges of the plants without digging up the whole clump. Tease the divisions out with as much root on them as possible and pot them up. Grow them on in light shade in the greenhouse until they are rooting well and plant them out in the summer. Cuttings of greenwood with a heel in the summer[200]. Cuttings of almost ripe shoots with a heel, July/August in a frame.

nwatta Requires a loose lean gritty well-drained soil in a very sunny position[200]. Succeeds in dry soils. Tolerates exposed positions[200]. Requires some protection from winter wet[1]. A very variable species, it has been divided into a number of distinct varieties[270]. Established plants resent root disturbance[200], though small plants can be moved successfully[270]. A slow growing plant[270]. A good bee plant[94].

### 4.2.328 Maianthemum canadense

Canada Beadruby, Canada mayflower
3 tin 7 cyuc 1 kcak 2 tcan 1 dwat 0.1 m hkuc
pimhimm cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Maianthemum canadense is a PERENNIAL growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit Leaves Root ShootsEdible Uses: Fruit[105, 161, 257]. We have no more details except a warning that the fruit should be used with caution. The fruit is about 6mm in diameter[200].

tcanta Plants can be used as ground cover in shady positions[187, 197], doing well in a wild or woodland garden[200].

dwatta Expectorant KidneyA tea made from the plant has been used in the treatment of headaches and as a kidney tonic for pregnant women[222, 257]. It is also used as a gargle for sore throats and as an expectorant[222, 257].

propta Seed - best sown quite thinly it as soon as it is ripe in a cold frame, it should germinate in the spring. Stored seed should be sown in late winter in a cold frame, it might take 18 months to germinate. Allow the seedlings to grow on in the pot for their first year, giving liquid feeds as necessary to ensure that they do not go hungry. Divide the plants

It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaf [2-1]. The species Gaillardia pinnatifida dried seeds can be ground into a powder then kneaded into seed butter and spread on bread[257] but no information was found for Gaillardia × grandiflora.

tcanta Containers Cut flowersGround cover for compact cultivars. Compact cultivars include G. x grandiflora “Arizona Sun” with stunning mahogany-red rimmed golden yellows (0.3m 12inches). G. x grandiflora “Mesa Peach” and “Mesa Red” (0.4m, 18 inches). Landscape uses include beds, borders, patios and containers. Locations include rock gardens, cottage garden, meadow, prairie, coastal, cutting garden and food forest. Sometimes grown as an annual. Attractive to butterflies and native bees. Insectory - excellent source of nectar for butterflies. Seeds provide food for birds. Good For Cut Flowers, Good For Containers, Extended Bloom Time (more than 4 weeks).

dwatta The species Gaillardia pinnatifida is known as a diuretic, taken to give relief from painful urination[216, 257]. And an infusion of the leaves is taken internally, and a poultice applied externally, in the treatment of gout[257]. No information could be found on Gaillardia × grandiflora.

propta Seed, basal cuttings, or division. Dividing them in spring or early fall every two to three years will improve vigor.

nwatta A short-lived perennial winter hardy to USDA Zones 3 [368-1]. It prefers full sun, sandy, Loamy or Silty soil, and moderate to dry soil moisture. Soil pH: 5.5 - 7.9. Gaillardia × grandiflora is drought tolerant but prefers a moist well-drained soil. Performs poorly in unamended heavy clay soils [368-1]. Gaillardia × grandiflora is a tetraploid hybrid resulting from a cross between a 3' tall perennial gaillardia (G. aristata) and a 2' tall annual gaillardia (G. pulchella). It arguably inherited its perennial habit from the former and its long flowering period and rapid growth rate from the latter [368-1]. Flower Color: Orange, Red, Rust, or Yellow. Blooms late spring to fall. Heat zones 1 -8. Plants are so prolific and long blooming that they often exhaust themselves and are then short-lived[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Several cultivars exist, among them ‘Arizona sun’ and ‘Arizona red shades’. Minimum Root Depth: 16 inches. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a ‘clumping’ habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 4.2.323 Chrysosplenium ameri-canum

Water Mat, American golden saxifrage

3 tlin 7 cyuc 1 kcaak 2 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli fyifxre7t hjonli

dwatta Chrysosplenium americanum is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: CondimentUsed as a spice in salads[177].

tcanta The plants creeping habit makes it a good ground cover for the bog garden[200].

dwatta None known

propta Seed - sow spring or autumn in a lightly shaded position in a cold frame. Stand the pot in 2cm of water. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a tray of water in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy,

larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in light shade in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Succeeds in most soils if they are moist. Requires a constantly wet but well-drained soil[200]. Prefers acid soils[200]. Prefers a shady position, succeeding in woodland. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 4.2.324 Dicentra spectabilis

Bleeding Heart, Japanese Bleeding Heart, Common Bleeding Heart

3 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Dicentra spectabilis is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves in spring - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[134]. Stored seed should be sown in early spring[175]. Germination usually takes place within 1 - 6 months at 15°c[175]. Two weeks warm stratification at 18°c followed by six weeks at 2°c can shorten up the germination time[134]. Prick out the plants into individual pots as soon as they are large enough to handle, grow them on for their first winter in a cold frame and plant them out into their permanent positions in late spring. Division in early spring[200]. Care must be taken since the plant strongly resents root disturbance[200]. Division is best carried out in late winter[188]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings 7 - 10cm long in sandy soil in a cold frame[200].

nwatta Landscape Uses:Border, Container, Foundation, Specimen, Woodland garden. Easily grown in a rich light soil[1]. Grows best in a light but good woodland soil, preferably not limy[208]. Prefers light shade and some shelter from winds[175]. Tolerates a sunny position if it is growing in a moist border but once planted the plant should not be disturbed since the roots are brittle[200]. A very ornamental plant[1], it is hardy to at least -20°c[187]. The seed is difficult to harvest, it ripens and is shed very quickly[134]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attracts birds, Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous.

## 4.2.325 Calochortus uniflorus

Large-Flowered Star Tulip, Monterey mariposa lily

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Calochortus uniflorus is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

powder made from the dried roots is said to quickly remove rough warts when rubbed on them[4]. It is not thought to be so useful for smooth warts[4]. The seeds are slightly narcotic and also contain saponins[4]. A poultice made from the seeds and leaves is used to draw out splinters[4]. A decoction of the seeds is used to soothe chilblains and chapped skin[7]. A homeopathic remedy is made from the fresh leaves[4]. It is used in the treatment of long-standing headaches accompanied with oppression of the ear[4].

propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta An easily grown plant, it succeeds in most well-drained soils, including dry ones, and prefers a sunny position[200]. Dislikes shade and wet soils[200]. Thrives on chalk[200]. Prefers a light soil[200]. Hybridizes with other members of this genus, though the progeny are usually sterile[200]. A very ornamental plant, it often self-sows, especially on dry calcareous soils[53, 124]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 4.2.298 Solidago graminifolia

Flat-Topped Goldenrod

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Solidago graminifolia is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe fresh or dried leaves are a tea substitute[183].

tcanta Mustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta Antiseptic Fibrifuge PectoralAntiseptic. An infusion of the dried powdered herb can be used[168]. A decoction of the root has been used in the treatment of chest pains and lung problems[257]. An infusion of the blossoms has been used in the treatment of some types of fevers[257].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. This plant has become a weed in its natural range and can be invasive under cultivation[200]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238].

## 4.2.299 Monarda menthifolia

Mint-Leaved Bergamot, Mintleaf bergamot

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Monarda menthifolia is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaLeaves - used as an aromatic tea[212]. The leaves are a very common and popular potherb with the Hopi Indians - they are gathered and dried in bundles for winter use[216].

tcanta None known

dwatta Anaesthetic Antiseptic DiaphoreticThe leaves and flowering stems are anaesthetic, antiseptic and diaphoretic[238]. An infusion is used in the treatment of fevers and sore throats[257]. The pulverized plant has been rubbed on the head to bring relief from a headache[257]. An infusion of the plant is used as a wash on wounds[257]. The plant is a source of the medicinal essential oil ‘thymol’, which is antiseptic[212].

propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°c. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in ordinary garden soil so long as it is not too dry[1, 200]. Requires a moist soil and a sunny position[200]. A good bee plant[200]. Subject to mildew in dry summers[200]. The Hopi Indians occasionally cultivate this plant as a pot herb[216].

## 4.2.300 Poa pratensis

Kentucky Blue Grass, Spreading bluegrass

3 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Poa pratensis is a PERENNIAL growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: One report suggests that it might be edible but gives no details[177]. It is quite probably referring to the seed (which is small and very fiddly too utilize) but might be referring to the base of the leaf stems, which is eaten in one other member of this genus.

tcanta None known

dwatta None known

propta Seed - surface sow in the spring in a cold frame. Do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in

the spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Erosion control, Ground cover. Succeeds in any well-drained moderately fertile soil in a sunny position[200]. A polymorphic species[17]. It can be grown in lawns[1]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

### 4.2.301 *Carex aquatilis*

Water sedge, Sitka sedge

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli hjonli

drutta *Carex aquatilis* is an evergreen Perennial growing to 1 m (3ft 3in) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower in July, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Stem bases - raw[257].

tcanta None known

dwatta None known

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.302 *Aconitum lycoctonum*

Wolfsbane

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tucp hwicli hrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli hjonli

drutta *Aconitum lycoctonum* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta There is a report that this root has been boiled and used for food in Lapland[2]. However, this is a very poisonous plant and such a use is very inadvisable[K].

tcanta None known

dwatta Alternative Anaesthetic Antiarthritic Antitussive Deobstruent Diaphoretic Diuretic Sedative StimulantThe root is alterative, anaesthetic, antiarthritic, antitussive, deobstruent, diaphoretic, diuretic, sedative and stimulant[178]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. If the flower stems are removed after flowering the plant will normally flower again later in the season[200]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. A polymorphic species[1]. The nomenclature is very confused for this species, *A. lycoctonum*. L. is treated as *A. septentrionale* by many botanists whilst *A. lycoctonum*. Auct. is *A. vulparia*[50].

### 4.2.303 *Frasera speciosa*

Green Gentian, Elkweed

3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tucp hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Frasera speciosa* is a BIENNIAL/PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[105, 106, 155, 161]. It has been reported that the N. American Indians ate the fleshy root of this plant, but caution is advised since the roots of closely related plants are used medicinally as emetics and cathartics[212]. See the notes above on toxicity.

tcanta ParasiticideThe root, when ground into a powder and then mixed with oil, has been used as a parasiticide in order to kill lice[155].

dwatta Contraceptive Febrifuge Laxative Parasiticide Stomachic TonicThe whole plant is febrifuge, pectoral, laxative and tonic[155, 257]. An infusion of the dried, powdered leaves, or the root, has been used in the treatment of diarrhoea[257]. A cooled decoction of the roots has been used in the treatment of asthma, colds, digestive complaints etc[257]. An infusion of the plant has been used as a contraceptive[213]. Caution is advised in the use of this plant, see the notes above on toxicity.

propta Seed - sow spring in a greenhouse[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in late winter[200].

nwatta Requires a moist but well-drained position and a stony peaty soil[1, 200]. Requires an acidic soil[200]. A very ornamental plant[1].

### 4.2.304 *Artemisia michauxiana*

Mountain Sagewort, Michaux's wormwood

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli priklwis hpa7tmwatli xre7t hjonli

drutta *Artemisia michauxiana* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed[105, 161, 177]. No further details are given, but the seed is very small and fiddly to use.

tcanta None known

dwatta PoulticeA hot infusion of the plant has been used in the treatment of headaches[257]. A poultice of the chewed plant is applied to sprains and swellings[257].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the

Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the following spring[K]. Basal cuttings in late spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta White horehound is an easily grown plant that succeeds in most well-drained soils[200], though it flourishes best in a poor dry soil[1, 4]. Another report says that the plant flourishes best where there is plenty of nitrogen in the soil[274]. It prefers neutral to alkaline soil conditions[238] and requires a warm sunny position if it is to do well[14]. Often grown in the herb garden and sometimes cultivated commercially as a medicinal herb[4, 61]. If the plant is cut back after flowering it will normally produce a second crop of leaves[238]. The fresh leaves have a pronounced musky smell, though this is lost once the plant is dried[245]. A good bee plant[1]. White horehound is a good companion plant for growing near tomatoes[24]. The tomatoes crop for a longer period and also produce a heavier crop[201]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 4.2.319 *Lithospermum canescens*

Paint Indian, Hoary puccoon

3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 0.2 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Lithospermum canescens* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: ColouringThe roots have been chewed with gum in order to colour the gum red[257]. The flowers have been chewed with gum in order to colour it yellow[257].

tcanta Dye MiscellanyA red dye is obtained from the root[46, 61, 207].

dwatta MiscellanyA tea made from the leaves is applied externally in the treatment of fevers accompanied by spasms[222].

propta Seed - sow spring in a cold frame. It is best sown in a soilless medium[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Requires a warm sunny position in a moderately fertile well-drained lime-free sandy soil[1, 200].

### 4.2.320 *Mertensia longiflora*

Small bluebells

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc hmimhtut cyutli tucp hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Mertensia longiflora* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flowers - raw[172]. Leaves - raw or cooked[172]. The leaves are rather hairy and are not so nice when eaten raw[172].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[1, 200]. Sow stored seed as early in the year as possible. Protect from direct sunlight[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division, with care, in early spring or autumn[200].

nwatta Easily grown in an ordinary garden soil with some shade[1, 111].

### 4.2.321 *Calochortus barbatus*

3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Calochortus barbatus* is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[92, 161].

tcanta None known

dwatta None known

propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. The bulbs can be planted straight out into their permanent positions but in areas with wet winters it might be best to store them overwinter and replant them in the spring. Stem bulbs, harvested from the stems after flowering. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a sunny position and must be kept dry over winter[1, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. It should not be crowded by other plants[214]. This species does well in a cold frame with the cover removed from March to October, it has been known to self-sow in such a situation[214]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. Bulbs frequently divide after flowering, the bulbets taking 2 years to reach flowering size[200]. Hand pollination is necessary if seed is required[1].

### 4.2.322 *Gaillardia x grandiflora*

Blanket flower

3 tlin 10 cyuc 1 kcaak 3 tcan 0 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli frusflatprikwisslip hpa7tmwatli hjonli

drutta *Gaillardia x grandiflora* is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Butterflies birds. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils.

dwatta Antibacterial Anticholesterolemic Antipyretic Antiseptic Cholagogue Diuretic VasodilatorThe plant is anticholesterolemic, antipyretic, antiseptic, cholagogue, diuretic and vasodilator[176]. It has an antibacterial action, inhibiting the growth of *Staphylococcus aureus*, streptococci, *Bacillus dysenteriae*, *B. typhi*, *B. subtilis*, *Pneumococci*, *C. diphtheriae*, *mycobacterium* etc[176]. It is used in the treatment of jaundice, hepatitis and inflammation of the gall bladder[176]. The plant is also used in a mixture with other herbs as a cholagogue[218].

propta Seed - sow late spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.316 Lithospermum incisum

Narrow-Leaf Gromwell, Narrowleaf stoneseed  
3 tin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli kyuctup hwicli hrasjlut hpa7tli prikrlwis hpa7tmwatli xre7t hjonli

drutta Lithospermum incisum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: TeaRoot - cooked[105, 161, 207, 212]. Eaten boiled or roasted[257]. The root has been used to make a tea[257].

tcanta Beads Dye Incense MiscellanyThe dried plant tops have been burnt as an incense[257]. A blue dye has been obtained from the roots[257]. A red dye is obtained from the roots[274]. It is quite possible that both colours can be obtained, depending on the mordant used[K]. The seeds have been used as beads[257].

dwatta Contraceptive Kidney Miscellany Ophthalmic Pectoral StomachicThe root has been chewed by some native North American Indian tribes as a treatment for colds[213]. The finely powdered leaves, root and stem have been rubbed on the body in the treatment of paralyzed limbs[257]. An infusion of the root has been used in the treatment of stomach aches and kidney problems[257]. The plant has been eaten as an oral contraceptive and also as a treatment for lung haemorrhages, coughs and colds[257]. A cold infusion of the pulverized root and seed has been used as an eyewash[257]. This plant was used as a medicine by various native North American Indian tribes and interest in the plant has revived recently as a possible source of modern drugs[212]. No more details are given.

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Requires a warm sunny position in a moderately fertile well-drained soil[1, 200]. Dislikes acid soils[1]. After producing large, conspicuous flowers in the spring, the plant produces lots of small very fertile cleistogamous flowers[274].

### 4.2.317 Corema conradii

Poverty Grass, Brook crowberry  
3 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta Corema conradii is an evergreen Shrub growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower in April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both

male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[106, 200]. The fruit is very small and dry, less than 3mm in diameter[235].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 5 months warm stratification followed by 3 months at 5°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current year's growth, November in a frame.

nwatta Requires a light or medium lime-free soil[11, 182], succeeding in full sun or light shade[182]. Dioecious, male and female plants must be grown if seed and fruit is required[182].

### 4.2.318 Marrubium vulgare

White Horehound, Horehound  
3 tin 7 cyuc 1 kcaak 3 tcan 3 dwat 0.5 m hkuc  
htut cyutli kyuctup hwicli hyishrasjlutnyik hpa7tli flatprikrlwis hpa7tmwatli fyifxre7t hjonli

drutta Marrubium vulgare is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to November, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: Condiment TeaThe leaves are used as a seasoning[27]. Bitter and pungent, they are sometimes used to flavour herb beer or liqueurs[4, 183]. Horehound ale is a fairly well-known drink made from the leaves[4, 238]. A mild pleasantly flavoured tea is made from the fresh or dried leaves[183], it is a favourite cough remedy[4, 46].

tcanta Companion Essential RepellentAn essential oil is obtained from the plant and used as a flavouring in liqueurs[46]. The plant has been used as a cure for cankerworm in trees[238]. No more details are given but it is probably a strong infusion of the flowering shoots, or the essential oil, that is used[K]. The growing plant repels flies[201].

dwatta Antidiarrhoeal Antidote Antiflatulent Antiseptic Antispasmodic Appetizer Cholagogue Diaphoretic Digestive Diuretic Emmenagogue Expectorant Hepatic Stimulant TB TonicWhite horehound is a well-known and popular herbal medicine that is often used as a domestic remedy for coughs, colds, wheeziness etc[4, 254]. The herb apparently causes the secretion of a more fluid mucus, readily cleared by coughing[254]. The leaves and young flowering stems are antiseptic, antispasmodic, cholagogue, diaphoretic, digestive, diuretic, emmenagogue, strongly expectorant, hepatic, stimulant and tonic[4, 7, 9, 21, 165, 238]. Horehound is a very valuable pectoral, expectorant and tonic that can be safely used by children as well as adults[4]. It is often made into a syrup or candy in order to disguise its very bitter flavour, though it can also be taken as a tea[4]. As a bitter tonic, it increases the appetite and supports the function of the stomach[254]. It can also act to normalize heart rhythm[254]. The plant is harvested as it comes into flower and can be used fresh or dried[238]. The root is a remedy for the bite of rattlesnakes, it is used in equal portions with *Plantago lanceolata* or *P. major*[207]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Marrubium vulgare* for dyspepsia, loss of appetite (see [302] for critics of commission E).

propta Seed - sow April/May or August/September in a cold frame. Germination can be slow and erratic[200].

greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.305 Salvia pratensis

Meadow Clary, Introduced sage  
3 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
htut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta Salvia pratensis is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe pungent, bitter flavoured herb has been used as a flavouring in beers and wines[183]. It is also used as an adulterant of sage[177, 183].

tcanta None known  
dwatta None known

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta An easily grown plant, it succeeds in a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Requires a good well-drained soil[187]. Hardy to about -25°C[187]. Plants can be killed by excessive winter wet[200]. Well suited to the wild garden, growing well in the summer meadow[200]. Plants have stout stems and require little if any staking[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. There are many named forms selected for their ornamental value[200].

### 4.2.306 Berberis koreana

Korean Barberry, Barberry  
3 tin 7 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli kyuctup hwicli hyishrasjlutnyikfrp hpa7tli flatprikrlwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis koreana is a deciduous Shrub growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked. The fruits are about 5mm long[200]. Young leaves - cooked[177].

tcanta DyeA yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Suckers, removed in late autumn/early winter and planted out in situ or potted up and planted out in late spring[200].

nwatta Landscape Uses:Erosion control, Pest tolerant, Hedge, Massing, Screen, Superior hedge, Woodland garden. Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. A very hardy plant, tolerating temperatures down to about -30°C[200]. Plants can be pruned back quite severely, they resprout well from the base[200]. Very stoloniferous, plants produce suckers freely[67, 200]. A very ornamental plant[67], it is closely related to *B. vulgaris*[1]. Hybridizes freely with other members of this genus[1]. The flowers are produced late in spring, thereby escaping spring frosts[67]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 4.2.307 Clematis recta

Ground virginibowser  
3 tin 7 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta Clematis recta is a PERENNIAL CLIMBER growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young shoot tips - cooked or pickled[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta Antirheumatic Diaphoretic Diuretic Homeopathy RubefacientThe flowers and leaves are diaphoretic, diuretic and rubefacient[4]. They are taken both internally and externally in the treatment of syphilitic, cancerous and other foul ulcers[4]. Caution is advised since this is a poisonous plant[4]. A homeopathic remedy is made from the plant. It is used in the treatment of rheumatism and skin eruptions[238].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Succeeds in any soil in full sun[187, 200], but prefers a fertile sandy loam[200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Does well on chalk. Dislikes winter wet[200]. Succeeds in acid as well as alkaline soils[200]. Plans are hardy to about -25°C[187]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the

object it is touching[212]. There are some named forms, selected for their ornamental value[233]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 4.2.308 *Lonicera canadensis*

Fly Honeysuckle, American fly honeysuckle  
3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Lonicera canadensis* is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[2, 177]. It is possibly edible[105]. The fruit is about 6mm in diameter[235].

tcanta None known  
dwatta Diuretic Sedative VDThe steeped branches are a very effective diuretic[207]. A decoction of the shoots is used in the treatment of chancres caused by syphilis[257]. The bark is sedative. An infusion has been given to children who cry all night[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200].

### 4.2.309 *Pedicularis canadensis*

Common Lousewort  
3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.4 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Pedicularis canadensis* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 161, 177, 257].

tcanta None known  
dwatta Antitumor Aphrodisiac Blood tonic Cardiac Poul-tice StomachicThe roots are blood tonic, cardiac and stomachic[257]. A tea is used in the treatment of stomach aches, ulcers, diarrhoea, anaemia and heart troubles[222, 257]. A poultice of the root is applied to swellings, sore muscles and tumours[218, 257]. The finely grated roots were secretly added to food as an alleged aphrodisiac[222]. An infusion of the leaves has been used to procure an abortion[257]. An infusion of the fresh or dried leaves has been used to treat a sore throat[257].

propta Seed - sow in pots of turf collected from the proximity of wild colonies or sow directly onto the sites where the plants are to remain[200]. Division of established plants might be possible in the spring. Establish the divisions near the parent plants[200]

nwatta A semi-parasitic plant, growing on grass roots. Rather difficult to establish in cultivation, it is best grown in conditions that approximate to its native habitat[200]. It requires a moist peaty soil and the presence of host grasses[1]. The plant is said to parasitize at least 80 different species in 35 different genera[274]. Requires a partially shaded to sunny site in a well-drained gritty but moist soil[200].

### 4.2.310 *Panax trifolius*

Ground Nut, Dwarf ginseng  
3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Panax trifolius* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from April to June, in flower in April. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[57, 63]. A very palatable taste after being boiled[183]. When cold it has a taste somewhat like nuts[183].

tcanta MiscellanyNone known  
dwatta MiscellanyAlthough closely related to the well-known herbal medicine ginseng, this species has been little researched for its medicinal virtues[222]. A tea made from the whole plant has been used in the treatment of colic, indigestion, gout, hepatitis etc[222]. The root is analgesic[257]. It has been chewed as a treatment for headache, short breath, fainting and nervous debility[222, 257].

propta Seed - sow in a shady position in a cold frame preferably as soon as it is ripe, otherwise as soon as the seed is obtained. It can be very slow and erratic to germinate. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a shady position in the greenhouse or frame for at least their first winter. Make sure the pots are deep enough to accommodate the roots. Plant out into their permanent positions in late summer. Division in spring.

nwatta Requires a moist humus-rich soil in a shady position in a woodland[1, 200]. The plant has leaves above the ground for only two months each year[222]. Although plants are hermaphrodite, individual flowers are often male[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

### 4.2.311 *Geranium erianthum*

Wooly Geranium  
3 tlin 7 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Geranium erianthum* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. Not choice[172]. Flowers - raw[172].

tcanta None known  
dwatta Astringent Salve StypticThe whole plant, but especially the roots, is astringent, salve and styptic. It can be used as a gargle for sore throats[172].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a range of soil types[200]. Plants are hardy to about -20°C[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 4.2.312 *Calochortus elegans*

Star Tulip, Elegant mariposa lily  
3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Calochortus elegans* is a BULB growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[2, 46, 61, 105, 161].

tcanta None known  
dwatta None known  
propta Seed - sow as soon as ripe or early spring in a cold frame in a very sharply draining medium. Stratification may be helpful. Germination usually takes place within 1 - 6 months at 15°C[138]. Leave the seedlings undisturbed for their first two years growth[138], but give them an occasional liquid feed to ensure they do not become nutrient deficient. It is quite difficult to get the seedlings through their first period of dormancy since it is all too easy either to dry them out completely or keep them too moist when they will rot[214]. After their second year of growth, pot up the dormant bulbs in late summer and grow them on for at least another 2 years in the greenhouse before trying them outside. Seedlings take about 5 - 7 years to come into flower[214]. Division of the bulbs as soon as the foliage dies down. The bulbs can be planted straight out into their permanent positions but in areas with wet winters it might be best to store them overwinter and replant them in the spring. Stem bulbs, harvested from the stems after flowering. They can be stored cool and dry then planted in pots in the cold frame in the spring.

nwatta Requires a deep very well-drained fertile sandy soil in a warm sunny position and must be kept dry from mid summer to late autumn[1, 42, 200]. This is a rather difficult plant to cultivate in Britain, it is very cold hardy but is intolerant of wetness especially in the winter[1, 42]. It is easiest to grow in a bulb frame but is worth trying outdoors at the base of a south-facing wall, especially with shrubs that like these conditions[120]. Bulbs can be lifted as soon as the foliage dies down in the summer and stored overwinter in a cool dry place, replanting in spring[138]. The bulbs must be replanted immediately according to another report[1]. Bulbs frequently divide after flowering, the bulblets taking 2 years to reach flowering size[200]. This species is closely related to *C. tolmei*[200]. Hand pollination is necessary if seed is required[1].

### 4.2.313 *Dryopteris fragrans*

Fragrant Woodfern  
3 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Dryopteris fragrans* is an evergreen Fern growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: TeaThe leaves are made into a tea[177, 183].

tcanta BeddingThe plant has been used as a bedding[257].

dwatta None known  
propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in

a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers an acid soil[200], requiring a well-drained gritty soil in a sunny or shady position[200]. Dislikes heavy clay. Prefers a good supply of water at its roots but succeeds in dry shade and tolerates drought when it is established. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1].

### 4.2.314 *Muscari botryoides*

Italian Grape Hyacinth, Common grape hyacinth, White Grape Hyacinth

3 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfkrx7t hjonli

drutta *Muscari botryoides* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: The flowers and flower buds can be pickled in vinegar[183].

tcanta Landscape Uses: Border, Container, Massing, Rock garden, Specimen, forest garden.

dwatta None known

propta Seed - best sown as soon as ripe in a greenhouse[200]. The seed can also be sown in early spring in a greenhouse. A good proportion of the seed usually germinates within 2 - 3 months. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first year of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in late summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. Division of offsets in July/August after the leaves die down[1]. It can be done every other year if a quick increase is required[1]. Larger bulbs can be replanted direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late summer.

nwatta A very easily grown plant[200], it prefers a rich open well-drained soil[1] but succeeds in any soil and situation[1, 42, 90]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°C[214]. Does very well in short grass[1], increasing freely and it can become invasive[200]. There are some named forms, selected for their ornamental value[200]. The flowers have a scent that resembles the honey-musk scent of buddleia[245]. Special Features:Attractive foliage, Naturalizing, Fragrant flowers.

### 4.2.315 *Artemisia scoparia*

Redstem wormwood  
3 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli hgatyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Artemisia scoparia* is a BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 3. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta EssentialThe seed and flowering stems contain 0.75% essential oil[240].



diness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers **Leaves** **Root****Edible Uses:** Leaves and young shoots - cooked[205]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177]. The flowers can be dried and used as a thickener in soups etc. The slender trumpets vary from 12 - 17cm long[205]. There can be from 7 to 65 buds on a flowering stem[205]. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. **Root** - raw or cooked[205]. The flavour is somewhat radish-like but not so sharp[205].

**tcanta Weaving**The tough dried foliage is plaited into cord and used for making footwear[16].

**dwatta Antidote Diuretic Vitamin C**The juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

**propta Seed** - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** Succeeds in most soils[1], including dry ones, preferring a rich moist soil[200]. Grows well in heavy clay soils. Succeeding in sun or shade, it produces more flowers in a sunny position though these flowers can be shorter-lived in very sunny positions[205]. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Plants are hardy to at least -20°c[187]. Widely cultivated in China for its edible flowers, especially in Hunan province[266]. Hybridizes freely with other members of this genus[200]. This species is said to be self-incompatible[127, 205]. Most of the plants in cultivation under this name are H. thunbergii[205]. The sub-species *H. citrina* *vespertina* (Hara.)Erhardt. is a very free-flowering form, producing up to 75 buds per scape and capable of flowering from July to October if the weather is suitable[205]. The plant forms a loose spreading clump[K]. The roots form pseudobulbs[205]. Plants take a year or two to become established after being moved[1]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. Individual flowers are very short-lived, they open in the late afternoon and die in the morning[200]. However, plants produce a succession of flowers for several weeks of the summer. The number of flowers on a scape varies from 7 to 65[205]. The flowers have a lemony scent[205]. Another report says that they have a pronounced honeysuckle scent[245].

### 5.2.41 *Beta vulgaris flavescens*

Swiss Chard

4 tlin 8 cyuc 4 kcak 2 tcan 2 dwat 0.9 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwssilph-som hpa7tmwatli xre7t hjonli

**drutta** *Beta vulgaris flavescens* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves **Stem****Edible Uses:** Leaves - raw or cooked like spinach[2, 16, 27, 33]. A very good spinach substitute, the leaves are large and easily harvested, yields are high[K]. Some people dislike the raw leaves since they can leave an unpleasant taste in the mouth[K]. Leaf

stems - cooked. The steamed stems retain their crispness and have a delicious flavour, they are considered to be a gourmet vegetable[K]. Flowering stem - cooked. A broccoli substitute[16].

**tcanta** CompanionAgroforestry Uses: Beet is said to be a good companion for dwarf beans, onions and kohlrabi[18], though the growth of spinach beet is inhibited by runner beans, charlock and field mustard[18].

**dwatta** Antitumor EmmenagogueAlthough little used in modern herbalism, beet has a long history of folk use, especially in the treatment of tumours[269]. A decoction prepared from the seed has been used as a remedy for tumours of the intestines. The seed, boiled in water, is said to cure genital tumours[269]. The juice or other parts of the plant is said to help in the treatment of tumours, leukaemia and other forms of cancer such as cancer of the breast, oesophagus, glands, head, intestines, leg, lip, lung, prostate, rectum, spleen, stomach, and uterus[269]. Some figure that betacyanin and anthocyanin are important in the exchange of substances of cancer cells; others note two main components of the amines, choline and its oxidation product betaine, whose absence produces tumours in mice[269]. The juice has been applied to ulcers[269]. A decoction is used as a purgative by those who suffer from haemorrhoids in South Africa[269]. Leaves and roots used as an emmenagogue[269]. Plant effective in the treatment of feline ascariasis[269]. In the old days, beet juice was recommended as a remedy for anaemia and yellow jaundice, and, put into the nostrils to purge the head, clear ringing ears, and alleviate toothache[269]. Beet juice in vinegar was said to rid the scalp of dandruff as scurf, and was recommended to prevent falling hair[269]. Juice of the white beet was said to clear obstructions of the liver and spleen[269]. Culpepper (1653) recommended it for treating headache and vertigo as well as all affections of the brain[269].

**propta** Seed - sow in situ in early April for the summer crop and again in early July to August for the winter and spring crop. It is also possible to obtain an earlier crop by sowing the seed in a tray in a greenhouse in March and planting out in April/May[264].

**nwatta** A very easily grown plant, it succeeds in sun or light shade in moist soils but prefers a rich well-drained light neutral to alkaline soil[33, 37]. Beets grow well in a variety of soils, growing best in a deep, friable well-drained soil abundant with organic matter, but doing poorly on clay. They prefer an open position and a light well-drained soil[52]. The optimum pH is 6.0 - 6.8, but neutral and alkaline soils are tolerated in some areas. Some salinity may be tolerated after the seedling stage. Beets are notable for their tolerance to manganese toxicity[269]. Beet is reported to tolerate an annual precipitation of 23 to 315cm, an average annual temperature range of 5.0 to 26.6°C and a pH of 4.2 to 8.2[269]. Plants are tolerant of saline soils and respond positively if salt is added to non-saline soils at a rate of about 30g per square metre[264]. Plants frequently self-sow if they are happy, sometimes too freely[K]. Swiss chard is sometimes cultivated by gardeners for its edible leaves and stems[16], it does not make a very good commercial crop since the leaves quickly droop after being harvested and therefore do not make the trip to market. The leaves are a good hot weather substitute for spinach[183] and can be available all year round if the winters are not too severe[K]. In severe winters it is possible to dig up some plants and move them to a protected area such as a greenhouse in order to produce fresh leaves[1]. A good companion for dwarf beans, onions and kohlrabi[18]. Its growth is inhibited by runner beans, charlock and field mustard[18].

### 5.2.42 *Pinus albicaulis*

White-Bark Pine

4 tlin 8 cyuc 4 kcak 3 tcan 2 dwat 20 m hkuc htut cyutli hqatkyuctcup hwicli hyishrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

**drutta** *Pinus albicaulis* is an evergreen Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in leaf all year, in flower from May to June, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light

86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is fleshy. Thick or swollen - fibrous or tap root [1-2]. This plant is the ornamental variety and so often mistaken for Common Comfrey it has the same distinct leaf continuation down the stem but is softer and more esthetically pleasing than Common Comfrey (Symphytum officinale).

### 4.2.397 *Liatris scariosa*

Devil's Bite

3 tlin 7 cyuc 0 kcak 0 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasljut hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

**drutta** *Liatris scariosa* is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta** None known

**tcanta** None known

**dwatta** Appetizer Diuretic Poultrice TonicThe root is appetizer, diuretic and tonic[4, 61, 238, 257]. It is used in the treatment of abdominal complaints, kidney and bladder problems[257]. A poultice made from the powdered roots is applied to snake bites[238] and external inflammations[257].

**propta** Seed - best sown as soon as it is ripe in autumn in a greenhouse[200]. Sow stored seed as soon as possible in the year in a greenhouse. Prick out the seedlings into individual pots when they are large enough to handle and grow the plants on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings taken in spring as growth commences. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta** Grows well in a moderately good light soil[200].Tolerates poor soils[200]. Plants are prone to rot overwinter in wet soils[200]. There are several named varieties, selected for their ornamental value[200]. A good bee plant. Rodents are very fond of the tubers so the plants may require some protection[200].

### 4.2.398 *Potentilla norvegica*

Norwegian Cinquefoil

3 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyixfre7t hjonli

**drutta** *Potentilla norvegica* is an ANNUAL/PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** None known

**tcanta** None known

**dwatta** The root is astringent. A decoction of the root has been gargled, or the root has been chewed, in the treatment of sore throats[257]. A cold infusion of the whole plant has been used to relieve pain[257]. The plant has been burnt and the fumes used to treat sexual infections[257]. All the above uses are recorded for the sub-species *P. norvegica* *monspeliensis*. (L.)Aschers. and Graebn.[257].

**propta** Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. An annual, biennial or short-lived perennial plant[17]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 4.2.399 *Gentiana acaulis*

Gentian

3 tlin 7 cyuc 0 kcak 0 tcan 3 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

**drutta** *Gentiana acaulis* is a PERENNIAL growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** None known

**tcanta** None known

**dwatta** Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Skin Stomachic TonicAn infusion of the whole plant is used externally to lighten freckles[7]. This species is one of several species that are the source of the medicinal gentian root[4], the following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

**propta** Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°c for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°c will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be

surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in early summer after the plant has flowered[239]. Dig up the entire plant, divide it into 2 - 3 fair-sized clumps with a spade or knife, and replant immediately[239]. Cuttings of basal shoots in late spring or early summer[238, 239]. It is best to pot them up in a cold frame until well rooted, and then plant them out into their permanent positions.

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This is an easily grown species, succeeding in most good garden soils, though it prefers a light loamy soil and lime-free conditions[187, 200, 239]. It grows well in a pocket of soil amongst paving stones, so long as there is a gritty substrate[200]. Plants dislike growing under the drip from trees[200]. A very ornamental plant, there are many named varieties[200]. It is a rare and protected species in the wild[7]. Plants are intolerant of root disturbance[200].

### 4.2.400 Galanthus nivalis

Snowdrop, Common Snowdrop
3 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc
hmim cyutli tcup hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Galanthus nivalis is a BULB growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from January to June, in flower from February to March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known
tcanta None known

dwatta EmmenagogueThe plant is emmenagogue[4].

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Sow the seed thinly so that there is no need to thin them. The seed usually germinates in the spring[1]. Grow them on in the same pot in a cold frame for the first two years, giving an occasional liquid feed to ensure the plants do not become nutrient deficient. Pot up the small bulbs whilst they are still in leaf in early summer of their second year's growth, putting about 3 bulbs in each pot. Grow them on in the cold frame for a further year before planting them out into their permanent positions in late spring whilst they are still in growth. The plants take about 4 years to flower from seed[200]. Division of offsets[1, 200]. This is best done immediately after the plants have finished flowering (and still have green leaves) though it can also be done in late summer and early autumn when the plants are dormant[200]. Scooping.

nwatta Landscape Uses:Alpine garden, Border, Container, Foundation, Massing, Rock garden, Woodland grass. Prefers a moist heavy loam[108], growing well in grass or amongst shrubs[1]. Prefers a shady position[28, 31]. The dormant bulbs are fairly hardy and will withstand soil temperatures down to at least -5°C[214]. A very ornamental plant[1], it grows well on the woodland edge[24]. The bulbs should be planted about 5 - 7cm deep as early in the spring as possible[1]. A good bee plant, providing an early source of pollen and nectar[108]. Special Features:Not North American native, Naturalizing, All or parts of this plant are poisonous, Fragrant flowers.

### 4.2.401 Packera aurea

Golden Groundsel - Life Root, Golden ragwort
3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.8 m hkuc
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Packera aurea is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known
tcanta None known

dwatta Abortifacient Birthing aid Diaphoretic Diuretic Emmenagogue Pectoral Stimulant Tonic Uterine tonicGolden groundsel is a medicinal plant that is deserving of greater attention[4]. This species was widely used by N. American Indians to treat various complaints of the female reproductive system, and also to ease childbirth[238]. Whilst often stated to be completely safe to use, recent research has found that the plant contains pyrrolizidine alkaloids that, in isolation, can cause liver damage and so this remedy can no longer be recommended for internal use[238, 254]. The roots and leaves are abortifacient, diaphoretic, diuretic, emmenagogue, pectoral, stimulant and uterine tonic[4, 46, 165, 207, 222]. It is used externally in the treatment of vaginal discharge[238]. A tea made from the plant was frequently used by the N. American Indians as a remedy for various female troubles, including the pain of childbirth[207, 213]. Pharmacologists have not reported any uterine effects, but the plant does contain an essential oil (inuline) plus the alkaloids senecine and senecionine (which are poisonous to grazing animals)[213]. The plant is harvested before flowering and the roots are harvested in the autumn, both are dried for later use[238].

propta Seed - sow spring in a greenhouse. Only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200]. Root cuttings in early spring[200].

nwatta An easily grown plant, it succeeds in a sunny position in most moderately fertile well-drained soils[200]. Prefers a damp to wet soil and also succeeds in partial shade[238]. Succeeds in the wild garden though it is invasive[200]. This species is cultivated in parts of Russia for use in the pharmaceutical industry[238]. A polymorphic species, there are many named varieties[43]. Senecio aureus L. is a synonym of Packera aurea (L.) Á.Löve and D.Löve For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.402 Helleborus niger

Black Hellebore
3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc
hmim cyutli tcup hwicli hrasjlutnyikfriip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Helleborus niger is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf all year, in flower from January to February, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta Miscellany ParasiticideUsed as a parasiticide against body lice, fleas etc[76]. This use is somewhat dan-

their permanent positions. Basal cuttings of young shoots in spring[111]. Harvest the young shoots when they are about 10 - 15cm tall and pot them up in a lightly shaded position in a greenhouse. They should root within 3 weeks and can be planted out in the summer or following spring.

nwatta Prefers a sunny position and a dry well-drained soil[187, 200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. The young growth in spring is very susceptible to slug damage[K]. The flowering plants are very attractive to bees and butterflies[K]. There is at least one named variety. 'Texas American' has an anise-pennyroyal fragrance and is used in a similar way to the species[183]. The plant is heat tolerant in zones 12 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 5.2.39 Viola odorata

Sweet Violet, English Violet, Garden Violet, Sweet Violet, Florist's Violet

4 tlin 8 cyuc 5 kcaak 3 tcan 3 dwat 0.1 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Viola odorata is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from February to April, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaYoung leaves and flower buds - raw or cooked[21, 85, 183]. Usually available all through the winter[K]. The leaves have a very mild flavour, though they soon become quite tough as they grow older. They make a very good salad, their mild flavour enabling them to be used in bulk whilst other stronger-tasting leaves can then be added to give more flavour[K]. When added to soup they thicken it in much the same way as okra[62, 85, 159]. Also used as a flavouring in puddings etc. A tea can be made from the leaves[85]. Flowers - raw. Used to decorate salads and desserts[5, 9, 85]. A sweet mild flavour with a delicate perfume, the flowers are an especially welcome decoration for the salad bowl since they are available in late winter[K]. The flowers are also used fresh to flavour and colour confectionery[238]. A soothing tea can be made from the leaves and flowers[85, 183]. A leaf extract is used to flavour sweets, baked goods and ice cream[183].

tcanta Essential LitmusAn essential oil from the flowers and leaves is used in perfumery[57, 100]. 1000kg of leaves produces about 300 - 400g absolute[46]. The flowers are used to flavour bread fresheners[238]. A pigment extracted from the flowers is used as a litmus to test for acids and alkalines[4, 13, 100, 115]. Plants can be grown as a ground cover when spaced about 30cm apart each way[208]. They make an effective weed-excluding cover[K]. ornamental. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiinflammatory Antirheumatic Cancer Demulcent Diaphoretic Diuretic Emetic Emollient Expectorant Homeopathy Laxative Purgative UrinarySweet violet has a

long and proven history of folk use, especially in the treatment of cancer and whooping cough[4, 165, 218]. It also contains salicylic acid, which is used to make aspirin[244]. It is therefore effective in the treatment of headaches, migraine and insomnia[244]. The whole plant is anti-inflammatory, diaphoretic, diuretic, emollient, expectorant, and laxative[4, 7, 21, 46, 165]. It is taken internally in the treatment of bronchitis, respiratory catarrh, coughs, asthma, and cancer of the breast, lungs or digestive tract[238]. Externally, it is used to treat mouth and throat infections[238]. The plant can either be used fresh, or harvested when it comes into flower and then be dried for later use[4]. The flowers are demulcent and emollient[240]. They are used in the treatment of biliousness and lung troubles[240]. The petals are made into a syrup and used in the treatment of infantile disorders[240]. The roots is a much stronger expectorant than other parts of the plant but they also contain the alkaloid violine which at higher doses is strongly emetic and purgative[4, 244, 254]. They are gathered in the autumn and dried for later use[7]. The seeds are diuretic and purgative. They have been used in the treatment of urinary complaints are considered to be a good remedy for gravel[4]. A homeopathic remedy is made from the whole fresh plant[4]. It is considered useful in the treatment of spasmodic coughs and rheumatism of the wrist[4]. An essential oil from the flowers is used in aromatherapy in the treatment of bronchial complaints, exhaustion and skin complaints[238].

propta Seed - best sown in the autumn in a cold frame. The seed requires a period of cold stratification and the germination of stored seed can be erratic. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Massing, Rock garden, Woodland garden. Succeeds in most soils but prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds[1, 14, 31, 200]. When grown in the open it prefers a moderately heavy rich soil[1]. Plants have done very well in a hot dry sunny position on our Cornish trial grounds[K]. Tolerates sandstone and limestone soils. Plants are hardy to about -20°C[187]. Sweet violets are very ornamental plants, there are many named varieties[187]. They produce their delicately scented flowers in late winter and early spring - these are designed for fertilisation by bees and since there are few bees around at this time of year these flowers seldom set seed[4]. However, the plants also produce a second type of flower later in the year. These never open, but seed is produced within them by self-fertilization[4]. The plants will often self-sow freely when well-sited[188]. They can also spread fairly rapidly at the roots when they are growing well[K]. Responds well to an annual replanting in rich loose leafy soils[187]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. Special Features: Edible, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Fragrant flowers. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.40 Hemerocallis citrina

Citron daylily
4 tlin 8 cyuc 4 kcaak 2 tcan 1 dwat 0.8 m hkuc
hmimhtut cyutli kyuctcup hwicli hrasjlutnyikfriip hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta Hemerocallis citrina is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in). See above for USDA har-

treat earache[254]. It also aids the formation of scar tissue on wounds, thus speeding up the healing process, and has been used as a cosmetic to remove freckles[7].

propta Plant out bulbs in late winter or very early spring. Plant firmly to half the bulbs depth and protect from birds until the bulbs have rooted[200]. (Birds seem to have a fascination for pulling the bulbs out of the ground and then leaving them lying on the surface[K].) Traditionally, bulbs were planted on the shortest day and harvested on the longest. Smaller bulbs are less likely to bolt as a result of exposure to cold conditions[200].

nwatta Prefers a sunny position in a light well-drained soil but tolerates most soils.[1, 200]. Does not grow well on heavy clays[200]. Prefers a pH in the range 6 to 7[200]. Tolerates a pH in the range 4.5 to 8.3. We are using the name *A. cepa ascalonicum* for this plant in order to differentiate it from the potato onion, *A. cepa aggregatum*, though it should really be included in *A. cepa aggregatum*[K]. This is a genuinely perennial form of *A. cepa* that is widely grown in temperate and tropical areas for its edible bulbs[200]. These are milder but smaller than the onion. There are several named forms[200]. The plant is easier to grow than onions, matures faster and keeps better[200], though yields are lower. Plants are very tolerant of high temperatures up to 30°C and bulbing only occurs at temperatures above 20°C[200]. Plants rarely produce viable seed in temperate areas, they are usually propagated by means of their bulbs, each one dividing up in the growing season to produce from 2 to more than 12 new bulbs[200]. Bulbs can become infected with virus, it is important to only plant clean stock[200]. Closely related to *A. oschaninii*. O.Fedsch., a wild species found in C. Asia. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.37 *Fragaria vesca* 'Semperflorrens'

Alpine Strawberry

4 tlin 8 cyuc 5 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli toup hwicli hrasljutnyikfrp hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta *Fragaria vesca* 'Semperflorrens' is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to November, and the seeds ripen from June to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Coffee TeaFruit - raw, cooked or made into preserves[183]. Sweet and succulent with an exquisite taste, they are far superior to the cultivated strawberry[K]. The fruit is fairly small, up to 15mm in diameter, but it is produced abundantly from early summer until the frosts of autumn[K]. Young leaves - raw or cooked[52, 105]. Added to salads or used as a potherb[183]. The fresh or dried leaves are used as a tea substitute[7, 177, 183]. The root has been used as a coffee substitute in India[240].

tcanta Compost TeethThe flowers are an alternative ingredient of 'Quick Return' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The fruit is used as a tooth cleaner[4]. The fresh fruit removes stains from teeth if it is allowed to remain for about 5 minutes[4]. The fruit is also used cosmetically in skin-care creams[7]. It tones and whitens the skin, combats wrinkles, lightens freckles, soothes sunburn and whitens the teeth[244].

dwatta Astringent Diuretic Laxative TonicThe leaves and the fruit are astringent, diuretic, laxative and tonic[4, 9, 222]. The leaves are mainly used, though the fruits are an excel-

lent food to take when feverish and are also effective in treating rheumatic gout[4]. A slice of strawberry is also excellent when applied externally to sunburnt skin[4]. A tea made from the leaves is a blood tonic[222]. It is used in the treatment of chilblains[53] and also as an external wash on sunburn[222]. The leaves are harvested in the summer and dried for later use[238]. The fruits contain salicylic acid and are beneficial in the treatment of liver and kidney complaints, as well as in the treatment of rheumatism and gout[244]. The roots are astringent and diuretic[4, 222]. A decoction is used internally in the treatment of diarrhoea and chronic dysentery[4, 244]. Externally it is used to treat chilblains and as a throat gargle[244]. The roots are harvested in the autumn and dried for later use[238].

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[27, 200]. Tolerates semi-shade though fruit production will be reduced when plants are growing in such a position. Prefers some shade according to some reports[3, 31]. Plants are often found on clay soils[31] and on soils overlying chalk[13]. Alpine strawberries appreciate a mulch of pine or spruce leaves[18]. The alpine strawberry is often cultivated in the garden for its edible fruit. This fruit is fairly small but exquisitely flavoured and is freely produced from June to November. There are some named varieties[183]. It is not very feasible to grow this plant on a commercial scale because it is very labour intensive to pick and it is also hard to get the fruit to market in good quality. However, it is sometimes grown by specialised growers for the luxury market. The main drawback of growing this plant is that it tends to lose vigour after about 2 - 3 years, partly due to virus diseases and partly because the plant flowers and fruits so freely that it exhausts itself.

### 5.2.38 *Agastache foeniculum*

Anise Hyssop, Blue giant hyssop

4 tlin 9 cyuc 5 kcaak 3 tcan 1 dwat 0.9 m hkuc htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta *Agastache foeniculum* is a PERENNIAL growing to 0.9 m (3ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 8 and is not frost tender. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Drink TeaLeaves and flowers - raw or cooked. They are used as a flavouring in raw or cooked dishes[108, 177, 257]. Excellent raw, they have a sweet aniseed flavour and are one of our favourite flavourings in salads[K]. They make a delicious addition to the salad bowl[183] and can also be used to flavour cooked foods, especially acid fruits[K]. The only drawback to the leaves is that they tend to have a drying effect in the mouth and so cannot be eaten in quantity[K]. A pleasant tasting tea is made from the leaves[46, 61, 161, 183].

tcanta Attracts wildlife. Invertebrate Shelter, nectary. Aromatic.

dwatta Cardiac Diaphoretic Pectoral PouliticeThe leaves are cardiac and diaphoretic[222, 238, 257]. An infusion of the leaves is used in the treatment of colds, fevers, weak heart etc[222]. When left to go cold, the infusion is used to treat pains in the chest (such as when the lungs are sore from too much coughing)[207]. A poultice of leaves and stems can be used to treat burns[257].

propta Seed - sow spring in a greenhouse and only just cover the seed. The seed usually germinates in 1 - 3 months at 13°C[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant out in late spring or early summer[K]. Division in spring. Fairly simple, if large divisions are used it is possible to plant them straight out into

gerous, see the notes above on toxicity. The powdered root has been used as a snuff[245]. Plants are suitable for ground cover when spaced about 45cm apart each way[208].

dwatta Anthelmintic Antiemetic Cardiac Cathartic Diuretic Emetic Emmenagogue Homeopathy Irritant Miscellany Narcotic Parasiticide PurgativeBlack hellebore is a very poisonous plant that is toxic when taken in all but the smallest doses. As such it should not be taken except under professional supervision. The plant contains cardiac glycosides which have a similar action to the foxglove (*Digitalis* spp) and it has been used as a heart stimulant for the elderly, though this treatment is no longer recommended[254]. The root is anthelmintic, cardiac, cathartic, diuretic, emetic, emmenagogue, irritant, violently narcotic and a drastic purgative[4, 9, 21, 46, 240]. It is harvested in the autumn and dried for later use[4]. It has been used in the treatment of dropsy, amenorrhoea, nervous disorders and hysteria, but it is very poisonous and great care must be taken over the dosage[4]. The root is also applied externally as a local irritant[4], but even this should be done with care, see notes above on toxicity. A homeopathic remedy is made from the roots[9]. It is used in the treatment of headaches, psychic disorders, enteritis and spasms[9].

propta Seed - best sown as soon as it is ripe in a cold frame[1, 134]. Sow stored seed as early in the year as possible[1], it usually germinates in the autumn to spring. Seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This species produces flowering plants in 2 - 3 years from seed[200]. Division after flowering or in autumn. Take care since the plant resents disturbance[111, 200].

nwatta Cultivation of this plant is not always easy, it prefers a rich limy soil in partial shade[187]. Succeeds in any good garden soil[1], growing and flowering best in a moist well-drained rich loam in a sheltered position in partial shade[1, 4, 31, 111, 244]. Succeeds when grown in the shade of a north-facing wall[233]. Does not object to lime[1]. Grows well in heavy clay soils[200]. Dislikes drought. Slugs are very fond of this plant and it will probably require some protection from them[187]. The various species in this genus hybridize freely[95]. Plants can flower in three years from seed[4]. A very ornamental plant, there are many named varieties[187]. Plants resent root disturbance and are slow to re-establish when divided[244]. They are best left undisturbed for 6 - 7 years before being divided[244]. Seedling plants should be placed in their permanent positions whilst still small[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 4.2.403 *Symphytum grandiflorum*

Ground Cover Comfrey, Comfrey

3 tlin 9 cyuc 0 kcaak 4 tcan 0 dwat 0.4 m hkuc pcmhmim cyutli toup hwicli hrasljutnyikfrp hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Symphytum grandiflorum* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta None known

tcanta A very good ground cover plant[188, 208]. It spreads rapidly to form a good carpet, rooting as it spreads, and should be spaced about 60cm apart each way[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Landscape Uses:Border, Container, Ground cover, Specimen, Woodland Forest Garden. Shelter for insects, nectary, Green mulch. Notable Products: Sheep and chicken food.

dwatta None known

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta Tolerates most soils and situations but prefers a moist soil and some shade[1, 4]. Grows well in heavy clay soils. Grows well under trees[208]. There are some named varieties, selected for their ornamental value[200]. Plants can be invasive, often spreading freely by means of self-sown seed[200]. The root system is very deep and difficult to eradicate, even small fragments of root left in the soil can produce new plants. Special Features:Attractive foliage, Fragrant foliage, Invasive, Naturalizing. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.404 *Adonis vernalis*

Pheasant's Eye, Spring pheasant's eye

3 tlin 7 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta *Adonis vernalis* is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta None known

tcanta None known

dwatta Antianxiety Antiarrhythmic Cardiotonic Diuretic Sedative VasoconstrictorMedicinal Parts: Roots and whole plant[301]. Pheasant's eye has a long history of medicinal use and is still retained in the Pharmacopoeias of several European countries[268]. The plant contains cardiac glycosides similar to those found in the foxglove (*Digitalis purpurea*)[254]. These substances improve the heart's efficiency, increasing its output at the same time as slowing its rate[254]. It also has a sedative action and so is generally prescribed for patients whose hearts are beating too fast or irregularly[254]. The herb is not often prescribed, however, due to irregular absorption[268]. The herb is cardiotonic, diuretic, sedative and vasoconstrictor[4, 7, 9, 13, 46, 238]. It has sometimes been used internally as a cardiotonic with success where the better known foxglove (*Digitalis purpurea*) has failed - especially where there is also kidney disease[4]. The herb is also used in the treatment of low blood pressure and its strong diuretic action can be used to counter water retention[254]. It is included in many proprietary medicines, especially since its effects are not cumulative[238]. The plants are harvested every third year as they come into flower[7], they are dried for use in tinctures and liquid extracts[238]. The herb does not store well so stocks should be replaced every year[238]. Use with great caution[9], see the notes above on toxicity. The plant is used

in homeopathy as a treatment for angina[254]. The German Commission E Monographs, a therapeutic guide to herbal medicine approve *Adonis vernalis* for arrhythmia, and nervous heart complaints (see [302] for critics of commission E)

propta Seed - best sown in a cold frame as soon as it is ripe or else it can be slow and erratic to germinate[200, 238]. Sow the seed in partial shade in rich soil in September or March[111]. Prick out the seedlings when they are large enough to handle and grow them on in the cold frame for their first season. Plant out when dormant in the autumn[K]. Division in early spring or in autumn. The divisions can be difficult to establish[200], so it is probably best to pot them up and keep them in a cold frame or greenhouse until they are growing away well.

nwatta Grows well in any ordinary garden soil that is not too heavy[1]. Prefers a moist well-drained soil in sun or semi-shade[4, 200]. Easily grown in a very well-drained rather dry soil in sun or part shade[187]. Plants flower better when growing in a sunny position[268]. This plant is adored by slugs and is therefore very difficult to grow in the open garden where slugs are common[187]. A very ornamental plant[1], it is rather rare in the wild so only cultivated plants should be harvested[7]. A greedy plant inhibiting the growth of nearby plants, especially legumes[54].

## 4.2.405 Actaea rubra

Red Baneberry

3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc  
pcimhmid cyutli tcup hwicli hrasljutnpyk hpa7tli flatprikwlis  
hpa7tmwatli xre7t hjonli

drutta *Actaea rubra* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Analgesic Antirheumatic Appetizer Emetic Galactagogue Purgative RubefacientThe whole plant, but especially the root, is analgesic, antirheumatic, galactagogue and rubefacient[172, 257]. The plant was often used medicinally by North American Indian tribes, though modern users should be aware of the plants potential toxicity. A tea made from the root is used as an appetizer, in the treatment of stomach pains, coughs, colds, menstrual irregularities, post partum pains, to increase milk flow and as a purgative after childbirth[222, 257]. Great caution should be employed if using this plant internally, the rootstock is a violent purgative, irritant and emetic[212].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame or outdoors in a moist shaded seedbed[200]. The seed has a limited viability[200], it can also be sown in spring in a cold frame but germination rates may be poor. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in late spring or early summer of the following year. Division in March or October.

nwatta Tolerates most conditions[233], but prefers a humus-rich moist soil in light shade[200, 233] doing well amongst shrubs and in light woods[1]. Also succeeds in denser shade[187]. Plants are hardy to at least -20°C[187]. A very ornamental plant[1]. *Actaea rubra* is part of a circum-boreal complex and is very similar to the black-fruited European species *A. spicata* (L.) with which it is sometimes considered conspecific[270]. The western North American plants of *A. rubra* have been called *A. arguta* and were distinguished on the basis of their smaller berries, more pubescent leaves, and narrow, more dissected leaflets. Those distinctions, however, are weak; specimens from the West often have fruits and leaves similar to those of plants from the East[270]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 4.2.406 Fritillaria pallidiflora

Pale-Flowered Fritillary

3 tlin 7 cyuc 0 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikwlis  
hpa7tmwatli xre7t hjonli

drutta *Fritillaria pallidiflora* is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Antispasmodic Antitussive Expectorant Febrifuge PectoralThe bulbs are antitussive, expectorant, febrifuge and pectoral[91, 176, 238]. They contain fritimine which lowers blood pressure, diminishes excitability of respiratory centres, paralyses voluntary movement and counters effects of opium[61, 238]. An infusion of the dried powdered bulb is used internally in the treatment of coughs, bronchitis, pneumonia, feverish illnesses, abscesses etc[238]. The bulbs also have a folk history of use against cancer of the breast and lungs in China[218, 238]. This remedy should only be used under the supervision of a qualified practitioner, excessive doses can cause breathing difficulties and heart failure[238]. The bulbs are harvested in the winter whilst they are dormant and are dried for later use[238].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta One of the best species in this genus for growing outdoors in Britain[90], it is easily grown in a moderately fertile well-drained soil so long as it is not allowed to dry out[42, 200]. Prefers a rich peaty soil in semi-shade[90]. Another report says that it succeeds outdoors when grown in a bed of river sand and leafmould about 60cm deep[1]. A very ornamental plant[1]. Cultivated for medicinal use in China[266].

## 4.2.407 Agrostis capillaris

Browntop Bent Grass

3 tlin 10 cyuc 0 kcaak 4 tcan 0 dwat 0.4 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hyhshrasljut hpa7tli frus-  
flatprikwlisshom hpa7tmwatli hjonli

drutta *Agrostis capillaris* is an evergreen Perennial growing to 0.4 m (1ft 4in) by 0.1 m (0ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. It can tolerate atmospheric pollution.

kcaakta None Known

tcanta FodderForest garden path mix [1-9]. Environmental Uses: Amenity, Erosion control or dune stabilization, Landscape improvement, Revegetation, Soil conservation. Ornamental: garden plant, Seed trade [1-8]. Agronomically valuable fodder and pasture grass for livestock production, occasionally cut for hay. Used in garden lawn mixtures and in particular for tennis courts and golf course fairways. Widely grown in mild (cool-humid) summers, including some parts of Australia, northern Europe, the USA and New Zealand. Compared to *A. stolonifera*, *A. capillaris* has a more upright

a flavouring in soups, stews and many other cooked dishes. Some cultivars have been selected for their smaller and often hotter bulbs and these are used for making pickles. Leaves - raw or cooked[2, 37]. There are some cultivars, the spring onions, that have been selected for their leaves and are used in salads whilst still young and actively growing - the bulb is much smaller than in other cultivars and is usually eaten with the leaves. By successional sowing, they can be available at any time of the year. Flowers - raw. Used as a garnish on salads. The flowers are somewhat dry and are less pleasant than many other species[K]. The seeds are sprouted and eaten. They have a delicious onion flavour[K].

tcanta Cosmetic Dye Hair Polish Repellent RustThe juice of the plant is used as a moth repellent and can also be rubbed onto the skin to repel insects[7]. The plant juice can be used as a rust preventative on metals and as a polish for copper and glass[7]. A yellow-brown dye is obtained from the skins of the bulbs[141, 168]. Onion juice rubbed into the skin is said to promote the growth of hair and to be a remedy for baldness[7, 254]. It is also used as a cosmetic to get rid of freckles[7]. The growing plant is said to repel insects and moles[201]. A spray made by pouring enough boiling water to cover 1kg of chopped unpeeled onions is said to increase the resistance of other plants to diseases and parasites[201].

dwatta Anthelmintic Antiinflammatory Antiseptic Antispasmodic Appetizer Carminative Diuretic Expectorant Febrifuge Homeopathy Hypoglycaemic Hypotensive Lithotropic Skin Stings Stomachic TonicAlthough rarely used specifically as a medicinal herb, the onion has a wide range of beneficial actions on the body and when eaten (especially raw) on a regular basis will promote the general health of the body. The bulb is anthelmintic, anti-inflammatory, antiseptic, antispasmodic, carminative, diuretic, expectorant, febrifuge, hypoglycaemic, hypotensive, lithotropic, stomachic and tonic[4, 7, 21]. When used regularly in the diet it offsets tendencies towards angina, arteriosclerosis and heart attack[254]. It is also useful in preventing oral infection and tooth decay[254]. Baked onions can be used as a poultice to remove pus from sores[254]. Fresh onion juice is a very useful first aid treatment for bee and wasp stings, bites, grazes or fungal skin complaints[7, 201]. When warmed the juice can be dropped into the ear to treat earache[254]. It also aids the formation of scar tissue on wounds, thus speeding up the healing process, and has been used as a cosmetic to remove freckles[7]. Bulbs of red cultivars are harvested when mature in the summer and used to make a homeopathic remedy[232]. This is used particularly in the treatment of people whose symptoms include running eyes and nose[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Allium cepa* Onion for appetite loss, arteriosclerosis, dyspeptic complaints, fevers and colds, cough/bronchitis, hypertension, tendency to infection, inflammation of mouth and pharynx, common cold (see [302] for critics of commission E).

propta Seed. Early sowings can be made in February in a greenhouse to be planted out in late spring. The main sowing is made in March or April in an outdoor seedbed, this bed must be very well prepared. A sowing can also be made in an outdoor seedbed in August of winter hardy varieties (the Japanese onions are very popular for this). These overwinter and provide an early crop of onion bulbs in June of the following year. Onion sets can be planted in March or April. Sets are produced by sowing seed rather thickly in an outdoor seedbed in May or June. The soil should not be too rich and the seedlings will not grow very large in their first year. The plants will produce a small bulb about 1 - 2cm in diameter, this is harvested in late summer, stored in a cool frost-free place over winter and then planted out in April. A proportion of the bulbs will run quickly to seed but most should grow on to produce good sized bulbs.

nwatta Prefers a sunny sheltered position in a rich light well-drained soil[1, 16]. Prefers a pH of at least 6.5[200]. Plants tolerate a pH in the range of 4.5 to 8.3. Onions are best grown in a Mediterranean climate, the hot dry summers ensuring that the bulbs are ripened fully[200]. For best growth, however, cool weather is desirable at the early stages of growth[200]. Plants are frost-tolerant but prolonged temperatures below 10°C cause the bulb to flower[200]. Optimum growth takes place at temperatures between 20 and 25°C[200]. Bulb formation takes place in response to long-day conditions[200]. Plants are perennial but the cultivated forms often die after flowering in their second year

though they can perennate by means of off-sets[1]. The onion was one of the first plants to be cultivated for food and medicine[244]. It is very widely cultivated in most parts of the world for its edible bulb and leaves, there are many named varieties capable of supplying bulbs all the year round[200]. This species was derived in cultivation from *A. oschaninii*[203]. Most forms are grown mainly for their edible bulb but a number of varieties, the spring onions and ever-lasting onions, have been selected for their edible leaves. There are several sub-species- *Allium cepa* 'Perutille' is the everlasting onion with a growth habit similar to chives, it is usually evergreen and can supply fresh leaves all winter. *Allium cepa aggregatum* includes the shallot and the potato onion. These are true perennials, the bulb growing at or just below the surface of the ground and increasing by division. Plants can be divided annually when they die down in the summer to provide bulbs for eating and propagation. *Allium cepa proliferum* is the tree onion, it produces bulbils instead of flowers in the inflorescence. These bulbils have a nice strong onion flavour and can be used raw, cooked or pickled. Onions grow well with most plants, especially roses, carrots, beet and chamomile, but they inhibit the growth of legumes[18, 20, 54, 201]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.36 Allium cepa ascalonicum

Shallot

4 tlin 8 cyuc 5 kcaak 0 tcan 3 dwat 0.3 m hkuc  
hpa7tli cyutli tcup hwicli hrasljut hpa7tli flatprikwlisslp  
hpa7tmwatli xre7t hjonli

drutta *Allium cepa ascalonicum* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked. A mild onion flavour, the bulbs can be up to 6cm in diameter. They can be added to salads etc, cooked as a vegetable or used as a flavouring in soups etc[1, 2, 16, 37]. Leaves - raw or cooked. A pleasant onion flavour, though they should not be harvested in quantity since this would reduce production of the bulbs[K]. Flowers - raw. Used as a garnish on salads. The flowers are somewhat dry and are less pleasant than many other species[K].

tcanta Cosmetic Dye Hair Polish Repellent RustThe juice of the plant is used as a moth repellent and can also be rubbed onto the skin to repel insects[7]. The plant juice can be used as a rust preventative on metals and as a polish for copper and glass[7]. A yellow-brown dye is obtained from the skins of the bulbs[141, 168]. Onion juice rubbed into the skin is said to promote the growth of hair and to be a remedy for baldness[7]. It is also used as a cosmetic to get rid of freckles[7]. The growing plant is said to repel insects and moles[201]. A spray made by pouring enough boiling water to cover 1kg of chopped unpeeled onions is said to increase the resistance of other plants to diseases and parasites[201].

dwatta Alterative Anthelmintic Antiinflammatory Antiseptic Antispasmodic Astringent Carminative Diuretic Expectorant Febrifuge Hypoglycaemic Hypotensive Lithotropic Nutritive Skin Stings Stomachic Tonic VulnaryAlthough rarely used specifically as a medicinal herb, the onion has a wide range of beneficial actions on the body and when eaten (especially raw) on a regular basis will promote the general health of the body. The bulb is anthelmintic, anti-inflammatory, antiseptic, antispasmodic, carminative, diuretic, expectorant, febrifuge, hypoglycaemic, hypotensive, lithotropic, stomachic and tonic[4, 7, 21]. When used regularly in the diet it offsets tendencies towards angina, arteriosclerosis and heart attack[254]. It is also useful in preventing oral infection and tooth decay[254]. Baked onions can be used as a poultice to remove pus from sores[254]. Fresh onion juice is a very useful first aid treatment for bee and wasp stings, bites, grazes or fungal skin complaints[7, 201]. When warmed the juice can be dropped into the ear to

## 5.2.33 *Fragaria x ananassa*

Strawberry  
4 tlin 8 cyuc 5 kcaak 3 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikhwis  
hpa7tmwatli fyifxre7t hjonli

drutta *Fragaria x ananassa* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA Hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw. Fruits of the best cultivars are sweet and succulent with an exquisite flavour[K]. Strawberries are a very popular fruit and are widely available in the summer. The fruit of some cultivars is up to 3cm in diameter[200]. Young leaves - raw.

tcanta A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta None known

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. This is a hybrid species and seed will not breed true, though this is the only way to develop new varieties. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required though should not then be allowed to fruit in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[200]. Tolerates semi-shade though fruit production will be reduced when plants grow in such a position. Strawberries appreciate a mulch of pine or spruce leaves[18]. The strawberry is widely cultivated in temperate areas for its edible fruit, there are many named varieties[183] that can supply fruit from late spring (under cloches) to late autumn. Most strawberry varieties are day-length sensitive and only flower at certain times of the year. However, a number of cultivars have been selected that are not sensitive to day-length and can produce fruit for most of the summer. These cultivars are normally referred to as 'remontants'. The blossom can be damaged by late spring frosts[1]. Oat straw should not be used as a mulch since this can infect the strawberries with stem and bulb eelworm. Strawberry plants are very subject to virus diseases, these are usually spread by an aphid. Plants tend to degenerate after a few years and need to be replaced. Seed is a safe means of propagation though, since this species is of hybrid origin, the seed will not breed true. Strawberries are a good companion plant, growing well with bush beans, spinach, borage, lettuce and pyrethrum[20]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.34 *Allium schoenoprasum sibiricum*

Giant Chives  
4 tlin 8 cyuc 5 kcaak 2 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flatprikhwis  
hpa7tmwatli xre7t hjonli

drutta *Allium schoenoprasum sibiricum* is a BULB growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and

heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves - raw, cooked or dried for later use. The leaves have a mild onion flavour and are an excellent addition to mixed salads, they can also be used as a flavouring in soups etc[90, 105]. This form has a stronger garlic flavour than common chives[183] The leaves are often available from late winter and can continue to produce leaves until early the following winter, especially if the plant is in a warm, sheltered position[K]. A good source of sulphur and iron[201]. The bulbs are rather small but can be used as spring onions[K]. They can be harvested with the leaves still attached and be used as spring onions[K]. They have a pleasant mild onion flavour. The flowers can be used as a garnish in salads etc[183]. The flowers of this species are rather dry and less desirable than the flowers of many other species[K].

tcanta Fungicide RepellentThe juice of the plant is used as an insect repellent, it also has fungicidal properties and is effective against scab, mildew etc[14, 18, 20]. The growing plant is said to repel insects and moles[14, 20].

dwatta Appetizer Digestive Hypotensive TonicThe whole plant has a beneficial effect on the digestive system and the blood circulation. It improves the appetite, is digestive, hypotensive and tonic[201]. It has similar properties to garlic (*A. sativum*), but in a much milder form, and it is rarely used medicinally[238].

propta Seed - sow spring in a cold frame. Germination is usually free and easy, pot up the seedlings as soon as they are large enough to handle easily and plant out in the following spring. Division can be carried out at almost any time of the year but is probably best done in spring. The clumps should be divided at least every 3 or 4 years in order to maintain vigour[200], the divisions can be planted out direct into their permanent positions.

nwatta An easily grown plant[203], it prefers a sunny position in a rich moist but well-drained soil[14, 37]. Succeeds in most soils[1, 37] and in light shade[203]. Grows well in heavy clay soils[203]. Tolerates a pH in the range 5.2 to 8.3. This is a more robust form of *A. schoenoprasum*, the chive. It is often grown in the garden for its edible leaves which are available from late winter to the beginning of the next winter[K]. The bulbs divide rapidly and large clumps are quickly formed. There are some named varieties[183]. Regular cutting of the leaves ensures a continuous supply of young leaves and prevents flowering[33]. Plants can be moved into a frame or other protected environment in the autumn and will then produce leaves throughout the winter[33]. Do not do this every year or it weakens the plants. The bulbs should be planted fairly deeply[1]. A good bee plant[24]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. Helps to reduce the incidence of scab when it is grown under apple trees[201]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.35 *Allium cepa*

Onion, Garden onion  
4 tlin 10 cyuc 5 kcaak 3 tcan 3 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljut hpa7tli flatprikhwisslip  
hpa7tmwatli xre7t hjonli

drutta *Allium cepa* is an evergreen Bulb growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Bulb - raw or cooked. A very versatile food, the bulb can be 10cm or more in diameter and is widely used in most countries of the world. Eaten raw, it can be sliced up and used in salads, sandwich fillings etc, it can be baked or boiled as a vegetable in its own right and is also commonly used as

growth habit and does not spread aggressively. Used outside its native range for erosion control and in rehabilitation work. A food source for herbivores, including rabbits [1-8].

dwatta None Known  
propta Seed

nwatta A rhizomatous and stoloniferous attractive, relatively short perennial grass. Ranging from 10 to 70 cm high. Soil drainage: free or impeded. Soil reaction: acid, alkaline, neutral. Dominant on poor and acidic soils. Soil texture: light or medium [1-8]. Found on a wide range of soils both damp and dry and from neutral to acidic. A hardy grass forming short grazed turf on poor soils on hills and mountains. Common and widespread in both lowland and upland pasture, meadows, heaths, open woodlands, road verges and banks. Upper elevation limit = 945m. Lower elevation limit = 0m.

## 4.2.408 *Lycopodium obscurum*

Ground Pine, Rare clubmoss  
3 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli flatprikhwis  
hpa7tmwatli hjonli

drutta *Lycopodium obscurum* is a FERN growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta Miscellany Mordant WeavingThe following uses are for *L. clavatum*. They quite possibly also apply to this species[K]. The spores are water repellent and can be used as a dusting powder to stop things sticking together[106, 171]. They are also used as a talcum powder and for dressing moulds in iron foundries[74]. They can also be used as explosives in fireworks and for artificial lightning[46, 57, 102, 171, 213]. The plant can be used as a mordant in dyeing[172]. The stems are made into matting[46].

dwatta Analgesic Antispasmodic Diuretic Miscellany Styptic TonicThe plant is analgesic, antispasmodic, blood tonic, diuretic and tonic[218, 257]. A decoction has been used as a herbal stealm in the treatment of rheumatism[257]. The spores of this plant are dusted on wounds or inhaled to stop bleeding noses. They can also be used to absorb fluids from injured tissues[213, 218, 257]. The spores can be used as a dusting powder to prevent pills sticking together[213].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. The spores are generally produced in abundance but are difficult to grow successfully[200]. Layering of growing tips[200].

nwatta Thrives in a rough spongy peat in a shady position[1]. Requires a humid atmosphere[200]. Terrestrial members of this genus are hard to establish. The roots are delicate and liable to rot, most water being absorbed through the foliage[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Although looking more like a moss, this genus is closely related to the ferns[200].

## 4.2.409 *Erica tetralix*

Bog Heather, Crossleaf heath  
3 tlin 7 cyuc 0 kcaak 3 tcan 0 dwat 0.3 m hkuc  
htut cyutli tcuphja7n hwicli hyhshrasljut hpa7tli frusflatprik  
hpa7tmwatli fyifxre7t hjonli

drutta *Erica tetralix* is an evergreen Shrub growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from June to October, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid

soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta Broom DyeStems are used for making brooms, brushes etc[109]. A yellow dye is obtained from the plant[46, 61]. Plants can be grown as a ground cover[208]. They should be clipped in the spring in order to encourage denser growth[208].

dwatta None known  
propta Seed - surface sow in a sandy compost in a cold frame in spring. Keep moist. Prick out the plants as soon as they are large enough to handle and plant them in their permanent positions when they are 5 - 8cm tall[11]. Cuttings of half-ripe wood, 3cm long taken from twiggly lateral growths near the base of the plant, July/August in a frame. Remove the leaves from the bottom part of the stem without causing any damage to the bark. The cuttings root in a few weeks if they are given some bottom heat. Plant out in spring[11]. Layering in spring or autumn. Plants can be 'dropped' and then dug up and divided about 6 - 12 months later. Dropping involves digging up the plant and then replanting it about 15 - 20cm deeper in the soil to encourage roots to form along the stems[78].

nwatta Requires a light lime-free loam[1]. A calcifuge plant, requiring a pH below 6[186]. Grows best in a poor soil[11]. Resents dry soils[1], doing well in boggy areas[186]. Prefers an open situation[1]. A good bee plant[108]. There are many named forms, selected for their ornamental value[188]. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 4.2.410 *Dicentra eximia*

Dwarf bleeding heart, turkey-corn  
3 tlin 9 cyuc 0 kcaak 4 tcan 0 dwat 0.4 m hkuc  
pcimhmim cyutli tcup hwicli hyhshrasljutnyik hpa7tli flatprik  
hpa7tmwatli hjonli

drutta *Dicentra eximia* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Birds, Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None Known

tcanta Groundcover: A medium density moderately good groundcover for shade and semi-shade. Colonizes very slowly through rhizomes. Wildlife Food: The nectar is sought by hummingbirds. Wildlife Habitat: Provides cover for small wildlife. Insectory: Attracts beneficial insects [318-1]. Good companion plants include; Jacobs Ladder and Wild Columbine. Cut Flowers. Ornamental: Ornamental foliage and flowers. The foliage is deeply cut and fern-like, and does not die back like the common bleeding heart. Flowers are shades of pink and white and heart shaped [318-1].

dwatta None known  
propta  
nwatta An herbaceous perennial growing well in semi-shade. USDA Hardiness Zones: 3 - 9. Soil pH: 5.5 - 7.0. Life Span: Long-Lived Perennial. Stand Persistence: Long. Form: Upright. Texture: Fine. Sun: Partial Shade, Shade. Soil Type: Loamy, Silty. Soil Moisture: Moderate. Minimum Root Depth: 6 inches (15cm). Root Type: Rhizome, Fibrous Shallow. Fungal Types: Endomycorrhizal. Seasonal Interest: Summer. Will tolerate full sun if given sufficient moisture. Requires rich well-drained soil. Flowering may stop in areas with very hot weather. Will not go dormant in midsummer like the Common Bleeding Heart as long as the soil is kept moist. Tolerant of proximity to black walnut trees. Fruit Type: Capsule. Flower Color: Pink, Red, White. Drought: Sensitive. Flood: Intolerant. Salt: Intolerant. Soil Compaction: Sensitive. Mowing: Intolerant. Cold Injury:

Inrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer, Rabbits. Growing Season: Cool. Bloom Time: Late Spring - Early Fall. Fruit Time: Fall - Winter [318-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

#### 4.2.411 *Lycopodium campanulatum*

3 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat m hkuc  
pcimhmimht cyuti tcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli hjonli

drutta *Lycopodium campanulatum* is a FERN. See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta *Miscellany Mordant*The spores are water repellent and can be used as a dusting powder to stop things sticking together[106, 171]. They are also used as a talcum powder and for dressing moulds in iron foundries[74]. They can also be used as explosives in fireworks and for artificial lighting[46, 57, 102, 171]. The plant can be used as a mordant in dyeing[172].

dwatta *Hypnotic Miscellany*The plant is hypnotic[192]. Chewing three stems is said to induce mild intoxication whilst eight can cause unconsciousness[192, 213].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. The spores are generally produced in abundance but are difficult to grow successfully[200]. Layering of growing tips[200].

nwatta Thrives in a rough spongy peat in a shady position[1]. Requires a humid atmosphere[200]. Terrestrial members of this genus are hard to establish. The roots are delicate and liable to rot, most water being absorbed through the foliage[200]. There is some doubt as to the correct spelling of this species name. I have a feeling that it could be a miss-spelling of *L. complanatum*. Members of this genus are rarely if ever troubled by browsing deer[233]. Although looking more like a moss, this genus is closely related to the ferns[200].

#### 4.2.412 *Solidago flexicaulis*

Zigzag goldenrod

3 tlin 9 cyuc 0 kcaak 3 tcan 0 dwat 0.6 m hkuc  
pcimhmimht cyuti hgatyuctcup hwicli hrasjlutnyik hpa7tli frusflatprk hpa7tmwatli hjonli

drutta *Solidago flexicaulis* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Leaves used for tea [1-2]. Edible seed [1-2]. No further information available.

tcanta A good nurse plant for sites prone to drought. Erosion Control. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. The flowerheads are pollinated by many kinds of insects, including long-tongued bees, small-tongued bees, wasps, flies, and butterflies. Several bees are oligoleges of *Solidago* spp. (Goldenrods). These species include: *Andrena hirticincta*, *Andrena nubicula*, *Andrena placata*, *Andrena simplex*, *Andrena solidaginis*, and *Colletes simulans armata*. Many insects feed on the leaves, flowers,

seeds, and roots of goldenrods. These insect feeders include plant bugs, stink bugs, aphids, leaf beetles, and the caterpillars of many moths. These insects are a source of food to many woodland songbirds and some upland gamebirds. White-tailed Deer readily browse on the foliage of Zigzag Goldenrod [1-6]. An interesting goldenrod for shady woodland areas [368-1].

dwatta Many species of *Solidago* have medicinal qualities although we have been unable to find information on *Solidago flexicaulis*.

propta Root Division , Seeds. Fresh seed or root division. Seed Collection: Seeds ripen soon after plant blooms.

nwatta A long-lived upright herbaceous perennial in the sunflower family (Compositae/Asteraceae). Prefers average, medium moisture, well-drained soils in full sun to part shade. This is a woodland species that perhaps does best in sun-dappled part shade, but will also grow in full shade. Established plants tolerate some dry soils [368-1]. Soil Type: Loamy, Silty. Tolerat ar clay or rocky soils. Soil Moisture: Moderate - mesic or dry soils. Minimum Root Depth: 20cm/8 inches. Root Type: Fibrous Shallow. Yellow flower; adds bright color to woodland gardens in fall. Bloom Time: July to September. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

#### 4.2.413 *Liatris spicata*

Gayfeather, Dense blazing star, Spiked Blazing Star, Button Snakevot, Gayfeather, Spiked Gayfeather,  
3 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimht cyuti hgattcuphja7n hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Liatris spicata* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought.

kcakta None known

tcanta *Pot-pourri Repellent*The aromatic leaves and roots are added to pot-pourri[238]. The leaves and the roots are added to various insect-repellent herbal mixtures[238].

dwatta *Anodyne Antibacterial Astringent Carminative Diaphoretic Diuretic Emmenagogue Expectorant Stimulant Tonic VD*The leaves and root are anodyne, antibacterial, astringent, carminative, diaphoretic, diuretic, emmenagogue, expectorant, stimulant and tonic[4, 21, 106, 238, 257]. The plant is said to be extremely efficacious when used as a local application in the treatment of sore throats and gonorrhoea[4]. It is also used in treating kidney diseases[238]. The leaves are harvested in the summer, the roots in the autumn. Both can be used fresh or dried[238].

propta Seed - best sown as soon as it is ripe in autumn in a greenhouse[200]. Sow stored seed as soon as possible in the year in a greenhouse. Prick out the seedlings into individual pots when they are large enough to handle and grow the plants on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings taken in spring as growth commences. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta *Landscape Uses:Border, Foundation, Massing, Seashore, Specimen.* Grows well in a moderately good light soil[1]. Requires a moist to wet position[1, 200, 238]. Established plants are very drought tolerant so long as there

flavour, somewhat like a cross between garlic and chives[K]. They are delicious in salads[183]. The flavour is destroyed by lengthy cooking[238]. The leaves are available from early spring until late in the autumn[K]. They contain about 2.6% protein, 0.6% fat, 2.4% carbohydrate, 0.95% ash. They also contain small amounts of vitamins A, B1 and C[179]. The rather small bulbs are about 10mm in diameter and are produced in clusters on a short rhizome[200]. Flowers and flower buds - raw or cooked[52, 88, 183]. A delicious flavouring and pretty garnish for the autumn salad bowl[K]. Root - raw or cooked. An edible oil is obtained from the seed[183].

tcanta *Oil Repellent*The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta *Antibacterial Cardiac Digestive Stomachic Tonic Urinary*The whole plant is antibacterial, cardiac, depurative, digestive, stimulant, stomachic and tonic[61, 174, 218]. It is an anti-emetic herb that improves kidney function[238]. It is used internally to treat urinary incontinence, kidney and bladder weaknesses etc[238]. The seed is carminative and stomachic[218]. They are used in India in the treatment of spermatorrhoea[240]. The leaves and the bulbs are applied to bites, cuts and wounds[218].

propta Seed - sow spring in a cold frame. The seed has a fairly short viability and should not be used when more than 1 year old[206]. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Plant out in late summer if the plants have developed sufficiently, otherwise plant them out the following spring. Division in early spring. Very easy, the plants divide successfully at almost any time of the year. The divisions can be planted straight out into their permanent positions if required.

nwatta *Landscape Uses:Border, Container, Ground cover, Rock garden.* An easily grown plant[203], it prefers a sunny position in a rich moist but well-drained soil[1, 88]. Tolerates most soils[52, 88], including clay[203, 206]. Tolerant of dry soils, established plants also resist drought[190]. Tolerates some shade, even in N.W. England[203]. The roots penetrate up to 50cm into the soil[206]. Tolerates a pH in the range 5.2 to 8.3. This plant succeeds in temperate and tropical climates[90]. It appears to be fully hardy in Britain[90]. Plants tolerate 40 degrees of frost in Manchuria (the report does not say if this is fahrenheit or centigrade)[206]. Plants remain green until temperatures fall below 4 - 5°C, they come into new growth in spring when temperatures go above 2 - 3°C[206]. Often cultivated for its edible leaves and bulb in the Orient, there are many named varieties[90, 183]. There are two main types of cultivar, one is grown for its leaves and the other for its flowering stem[200, 206]. This species is being increasingly grown as a garden vegetable in Britain[K]. A very ornamental plant, it grows well as an edging plant in the flower garden[K]. Closely related to *A. ramosum*[203]. The bulbs should be planted fairly deeply[1]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. **Special Features:** Edible, Fragrant foliage, Not North American native, Invasive, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

#### 5.2.32 *Allium ursinum*

Wild Garlic

4 tlin 8 cyuc 5 kcaak 0 tcan 3 dwat 0.3 m hkuc

pcimhmimht cyuti tcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Allium ursinum* is a BULB growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from February to June, in flower from May to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta *Edible Parts: Flowers Leaves Root*Edible Uses: Leaves - raw or cooked[2, 5, 9, 12, 24]. Usually available from late January[K]. One report says that they have an overpowering garlic odour that dissipates on cooking[183], though our experience is that they are considerably milder than garlic[K]. The leaves make a very nice addition to salads, and are especially welcome as a vital and fresh green leaf in the middle of winter[K]. Flowers - raw or cooked. These are somewhat stronger than the leaves, in small quantities they make a decorative and very tasty addition to salads[K]. The flowering heads can still be eaten as the seed pods are forming, though the flavour gets even stronger as the seeds ripen[K]. Bulb - raw or cooked[2]. A fairly strong garlic flavour, though it is quite small and fiddly to harvest[K]. The bulbs can be harvested at any time the plant is dormant from early summer to early winter. Harvested in early summer, they will store for at least 6 months[K]. The bulbs can be up to 4cm long and 1cm in diameter[00]. The small green bulbs are used as a caper substitute[183].

tcanta *Companion Disinfectant Repellent*The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20]. The juice of the plant has been used as a general household disinfectant[7].

dwatta *Anthelmintic Antiasthmatic Anticholesterolemic Antiseptic Antispasmodic Astringent Cholagogue Depurative Diaphoretic Disinfectant Diuretic Expectorant Febrifuge Hypotensive Rubefacient Stimulant Stomachic Tonic Vasodilator*Ramsons has most of the health benefits of the cultivated garlic, *A. sativum*[7, 238], though it is weaker in action[254]. It is therefore a very beneficial addition to the diet, promoting the general health of the body when used regularly. It is particularly effective in reducing high blood pressure and blood cholesterol levels[9]. It is recognised as having a good effect on fermentative dyspepsia[244]. All parts of the plant can be used, but the bulb is most active. The plant is anthelmintic, antiasthmatic, anticholesterolemic, antiseptic, antispasmodic, astringent, cholagogue, depurative, diaphoretic, diuretic, expectorant, febrifuge, hypotensive, rubefacient, stimulant, stomachic, tonic and vasodilator[7, 21]. Ramsons ease stomach pain and are tonic to the digestion, so they can be used in the treatment of diarrhoea, colic, wind, indigestion and loss of appetite[254]. The whole herb can be used in an infusion against threadworms, either ingested or given as an enema[254]. The herb is also beneficial in the treatment of asthma, bronchitis and emphysema[254]. The juice is used as an aid to weight loss and can also be applied externally to rheumatic and arthritic joints where its mild irritant action and stimulation to the local circulation can be of benefit[254].

propta Seed - best sown as soon as it is ripe either in situ or in a cold frame. It germinates quickly and can be grown on in the greenhouse for the first year, planting out the dormant bulbs in the late summer of the following year. Stored seed can be sown in spring in a greenhouse. Division in summer after the plants have died down. Very easy, the divisions can be planted out straight into their permanent positions.

nwatta Prefers woodland conditions in a moist well-drained soil[203]. Plants are often found in the wild growing in quite wet situations[K]. When growing in suitable conditions, wild garlic forms a dense carpet of growth in the spring and can be a very invasive plant[24, 203, K]. It dies down in early summer, however, allowing other plants to grow in the same space[K]. The bulbs should be planted fairly deeply[1]. The seeds are dispersed by ants[244]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].



PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves and young shoots - cooked[105, 116, 177, 183]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 127, 177, 183]. The flowers are crisp and succulent with a delicious sweet flavour and no aftertaste[K]. The flowers can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Plants form a spreading clump and are suitable for ground cover when spaced about 45cm apart each way[208]. The dead leaves should be left on the ground in the winter to ensure effective cover[208]. (This report was for a plant labelled *H. mid-dendorfi*ana, which I have assumed is a mis-spelling of this species[K])

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. Individual flowers only live for one day[205]. Plants take a year or two to become established after being moved but then form large clumps[200, 187]. The roots are fibrous without any obvious swellings[205]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

### 5.2.30 Crataegus missouriensis

4 tlin 8 cyuc 5 kcak 0 tcan 2 dwat m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Crataegus missouriensis is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The size of a large cherry, the flesh is sweet, soft and fairly juicy[K]. The fruit is only about 10mm thick according to another report[235]. The fruit ripens in mid to late September in southern Britain[K], it makes a delicious dessert fruit and can also be used in making pies, preserves etc[K]. The fruit can be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This species has a good potential as a fruit crop in Britain. It regularly produces heavy crops of high quality, the tree is very easily grown and is little troubled by pests or diseases. It also requires very little attention, once the trees are established virtually the only work needed is to harvest the fruit each year[K]. A plant growing at Hillier Arboretum was about 3 metres tall (with a trunk 2 metres long) and 3 metres wide, it was fruiting well in 1993 and 1994[K]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 5.2.31 Allium tuberosum

Garlic Chives, Chinese chives, Oriental Chives, 4 tlin 8 cyuc 5 kcak 3 tcan 2 dwat 0.3 m hkuc htut cyutli hgatkyuctup hwicli hrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Allium tuberosum is a BULB growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves Oil RootEdible Uses: OilLeaves - raw or cooked[1, 15, 46, 52, 88]. A mild

is plenty of humus in the soil[190]. Prefers a sunny position[108] but succeeds in shade[111]. Plants are hardy to about -25°C[187]. The plant has an agreeable odour, due to the presence of coumarins[4]. A good bee plant[1]. Rodents are very fond of the tubers so the plants may require some protection[200]. Slugs are fond of the young shoots in spring[238]. Special Features: Attracts birds, Attractive foliage, North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

### 4.2.414 Echinops latifolius

3 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 0.5 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Echinops latifolius is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta None known

dwatta Antiinflammatory GalactagogueThe root is anti-inflammatory and galactagogue[176]. It is used in the treatment of breast abscesses with inflammation, mastitis, lack of milk in nursing mothers and distension of the breast[176].

propta Seed - sow early spring in a cold frame[111]. The seed usually germinates in 3 - 9 weeks at 25°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in an outdoor seedbed in mid spring and is then planted out into its permanent position in late summer or the autumn[111]. Division in autumn[111]. Root cuttings in the winter[200].

nwatta Succeeds in a sunny position in any well drained soil of low or medium fertility[200]. Established plants are drought tolerant[190]. The flowers are often used for dried flower displays[200]. If all the flowers are removed early in the season, the plant will often produce a second flush of bloom later in the summer[200].

### 4.2.415 Mitella diphylla

Mitrewort, Twoleaf miterwort 3 tlin 7 cyuc 0 kcak 2 tcan 1 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Mitella diphylla is an evergreen Perennial growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta A good ground cover in moist woodland[200]. Plants form a carpet and should be spaced about 45cm apart each way[208].

dwatta Febrifuge OphthalmicAn infusion of the leaves is used to treat fevers[200]. The infusion can also be used as eye drops for sore eyes[257].

propta Seed - we have no information for this species but suggest sowing it as soon as it is ripe or in early spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in moist woodlands and in pockets in rock gardens[200]. Requires a moist humus-rich soil[208]. Self-sows when grown in a rich soil[200] and usually spreads quickly by this means[208]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern

is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 4.2.416 Anemone canadensis

Canadian Anemone 3 tlin 7 cyuc 0 kcak 0 tcan 2 dwat 0.6 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyfxre7t hjonli

drutta Anemone canadensis is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta None known

dwatta Anthelmintic Antiaphonic Antiseptic Astringent Ophthalmic StypticThe roots and leaves are astringent and styptic[222]. The root and leaves of this plant was one of the most highly esteemed medicines of the Omaha and Ponca Indians[207]. A decoction of the root was used as an anthelmintic and to treat pain in the lumbar region[257]. An infusion of the root was used as an eye wash to treat crossed eyes, twitches and eye poisoning[257]. A wash of the pounded boiled root or of the leaves was applied externally to wounds, nosebleeds, sores etc[213, 222, 257]. The root contains anemonin, which is said to be a potent anti-septic[213]. A tea of the roots was used in the treatment of headaches and dizziness[213]. The root was eaten to clear the throat so that a person could sing well[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Landscape Uses:Border, Woodland garden. Succeeds in ordinary garden soil but prefers a well-drained woodland soil and some shade[200]. An easily grown plant, preferring a sunny position[233]. Plants succeed in maritime gardens[233]. Hardy to at least -20°C[187]. This species is closely related to *A. virginiana*[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. A good woodland plant[1, 187]. Special Features:North American native, Naturalizing, Suitable for cut flowers.

# 5 4 tlin

## 5.1 bwon

### 5.1.1 Apios fortunei

Hodo, Hodoimo tfo2n 4 tlin 9 cyuc 5 kcak 3 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprikklwis hpa7tmwatli xre7t hjonli

drutta Apios fortunei is a PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Tuber - raw or cooked[105, 177]. It has a delicious flavour somewhat like sweet potatoes when roasted[179]. The tuber can also be dried and ground into a powder. The tuber contains about 4.2% protein, 0.2% fat, 18.3% starch, 6% other carbohydrate, 1.3% ash[179].

tcanta None known

dwatta TonicThe root is tonic[218].

propta Seed - pre-soak for 3 hours in tepid water and sow February/March in a cold frame. The seed usually germinates in 1 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for their first winter, planting them out in late spring or early summer. Division can be carried out at almost any time of the year, though spring is probably the best time. Simply dig up the roots, harvest the tubers and replant them where you want the plants to grow. It is also possible to harvest the tuber in winter, store them in a cool fairly dry but frost-free place over the winter and then plant them out in the spring. The tubers lose moisture rapidly once they have been harvested, so make sure that you store them in a damp medium such as leafmold.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Prefers a light rich soil and a sunny position[1, 27]. Another report says that it prefers light dappled shade[200]. Tolerates acid soils[160]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.1.2 Hippophae rhamnoides turkestanica

Sea Buckthorn

tfo2n 4 tlin 7 cyuc 5 kcaak 5 tcan 5 dwat 6 m hkuc htut cyutli hgatkuyctucuphja7n hwicli hysihrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Hippophae rhamnoides turkestanica is a deciduous Shrub growing to 6 m (19ft) by 2.5 m (8ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Very rich in vitamin C (120mg per 100g)[74] and vitamin A[183], but too acid when raw for most peoples tastes[11, 158]. Used for making fruit juice, it is high in vitamins and has an attractive aroma[141]. It is being increasingly used in making fruit juices, especially when mixed with other fruits, because of its reputed health benefits[214]. The fruits of some species and cultivars (not specified) contain up to 9.2% oil[214]. The fruit is very freely borne along the stems[K] and is about 6 - 8mm in diameter[200]. The fruit becomes less acid after a frost or if cooked[74]. The fruit is ripe from late September and usually hangs on the plants all winter if not eaten by the birds. It is best used before any frosts since the taste and quality of frosted berries quickly deteriorates[214].

tcanta Charcoal Dye Fuel Soil stabilization WoodVery tolerant of maritime exposure[29, 49, 75, 182], it can be used as a shelter hedge. It dislikes much trimming[75]. A very

thorny plant, it quickly makes an impenetrable barrier. Sea buckthorn has an extensive root system and suckers vigorously and so has been used in soil conservation schemes, especially on sandy soils. The fibrous and suckering root system acts to bind the sand[186, 244]. Because the plant grows quickly, even in very exposed conditions, and also adds nitrogen to the soil, it can be used as a pioneer species to help the re-establishment of woodland in difficult areas. Because the plant is very light-demanding it will eventually be out-competed by the woodland trees and so will not out-stay its welcome[K]. The seeds contain 12 - 13% of a slow-drying oil[240]. The vitamin-rich fruit juice is used cosmetically in face-masks etc[9]. A yellow dye is obtained from the fruit[74]. A yellow dye is obtained from the stems, root and foliage[4]. A blackish-brown dye is obtained from the young leaves and shoots[74]. Wood - tough, hard, very durable, fine-grained. Used for fine carpentry, turning etc[46, 61, 74]. The wood is also used for fuel and charcoal[146].

dwatta Astringent Cancer Cardiac Eczema Poulitce Tonic Vermifuge Vitamin CThe twigs and leaves contain 4 - 5% tannin[240]. They are astringent and vermifuge[7, 100]. The tender branches and leaves contain bio-active substances which are used to produce an oil that is quite distinct from the oil produced from the fruit. This oil is used as an ointment for treating burns[214]. A high-quality medicinal oil is made from the fruit and used in the treatment of cardiac disorders, it is also said to be particularly effective when applied to the skin to heal burns, eczema and radiation injury, and is taken internally in the treatment of stomach and intestinal diseases[214]. The fruit is used as a tonic[9]. The freshly-pressed juice is used in the treatment of colds, febrile conditions, exhaustion etc[9]. The fruit is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - sow spring in a sunny position in a cold frame[78]. Germination is usually quick and good although 3 months cold stratification may improve the germination rate. Alternatively the seed can be sown in a cold frame as soon as it is ripe in the autumn. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a greenhouse for their first winter. Plant out in late spring into their permanent positions. Male seedlings, in spring, have very prominent axillary buds whilst females are clear and smooth at this time[78]. Cuttings of half-ripe wood, June/July in a frame[200]. Difficult[113]. This is the easiest method of vegetative propagation[214]. Cuttings of mature wood in autumn[200]. Difficult[113]. The cuttings should be taken at the end of autumn or very early in the spring before the buds burst. Store them in sand and peat until April, cut into 7 - 9cm lengths and plant them in a plastic tent with bottom heat[214]. Rooting should take place within 2 months and they can be put in their permanent positions in the autumn[214]. Division of suckers in the winter. They can be planted out direct into their permanent positions and usually establish well and quickly[K]. Layering in autumn[200].

nwatta Landscape Uses:Border, Seashore, Specimen. Succeeds in most soils[200], including poor ones[186], so long as they are not too dry[182, 200]. Grows well by water and in fairly wet soils[182]. Established plants are very drought resistant[186]. Requires a sunny position[3], seedlings failing to grow in a shady position and mature shrubs quickly dying if overshadowed by taller plants[186]. Does well in very sandy soils[1, 186]. Plants are very tolerant of maritime exposure[75], though they are fairly slow growing[75]. Although usually found near the coast in the wild, they thrive when grown inland[11] and are hardy to about -25°C[184]. A very ornamental plant[1, 11], it is occasionally cultivated, especially in N. Europe, for its edible fruit[183]. Members of this genus are attracting considerable interest from breeding institutes for their nutrient-rich fruits that can promote the general health of the body (see edible and medicinal uses below)[214]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[113, 186, 200]. Plants produce abundant suckers, especially when grown on sandy soils[186]. Dioecious. Male and female plants must

the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Management: Coppice Management: Standard Regional Crop Staple Crop: Protein-oilAn easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wild tolerant[1, 11]. A very hardy plant but the male flowers can be damaged by heavy frosts at flowering time[200]. The filbert is often cultivated for its edible seeds[50], there are many named varieties[63]. It has often been hybridized with C. avellana in breeding programmes[11]. Plants are self-fertile but a more certain crop is obtained if more than one cultivar is grown[200]. The main difference between cob nuts and filberts is that the husk of a filbert is longer than the seed and often completely encloses it, whilst the husk on a cob nut is shorter than the seed[200]. Squirrels are a major pest of this plant, often decimating the crop of nuts[200]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

## 5.2.28 Daucus carota sativus

Carrot

4 tlin 10 cyuc 5 kcaak 4 tcan 3 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli fyixfre7t hjonli

drutta Daucus carota sativus is a BIENNIAL growing to 1.2 m (4ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Coffee Colouring CondimentRoot - raw or cooked[2, 7, 27]. The roots of well-grown plants are crisp, sweet and juicy, they are very nice raw and are also cooked as a vegetable or added to soups, stews etc[K]. The grated root is a tasty addition to the salad bowl[K]. The juice can be extracted from the root and used as a health-promoting drink[46]. The root is very rich in carotene, which is transformed by the body into vitamin A when it is eaten[7]. The root is sometimes ground into a powder and used in making cakes, bread etc[7, K]. The roasted root is a coffee substitute[21, 46]. Carotin, extracted from the roots, is used as an orange-yellow food dye[171]. Leaves - raw or cooked. A very strong flavour, they can be added in small quantities to mixed salads[K]. The leaves contain an oil that is rich in vitamin E, they are sometimes used as a flavouring in soups[7]. An essential oil from the seed is used as a food flavouring.

tcanta Alcohol Dye EssentialThe roots are fermented in order to produce alcohol[7]. An orange dye is obtained from the root[171]. An essential oil from the seed has a distinctive fragrance and is used in perfumery[7, 46].

dwatta Anthelmintic Carminative Deobstruent Diuretic Galactogogue Ophthalmic StimulantCultivated carrot roots are a rich source of beta-carotene, which is converted to vitamin A by the liver[254]. When used as a regular item in the diet the roots improve eyesight and skin health, and also have anti-cancer effects[238]. A wonderful cleansing medicine, it supports the liver and stimulates urine flow and the removal of waste by the kidneys[254]. The root is diuretic and ophthalmic[7]. The juice of organic carrots is a delicious drink and a valuable detoxifier[254]. The raw root, grated or mashed, is a safe treatment for threadworms, especially in children[254]. The seed is carminative, galactogogue, lithontripic and stimulant[7, 240]. They are useful in the treatment of kidney diseases, dropsy and to settle the digestive system[240, 254]. They stimulate menstruation and have been

used in folk medicine as a treatment for hangovers[254].

propta Seed - sow in situ in succession from early spring to early summer. Do not transplant the seedlings, since this will usually cause damage to the roots and a good crop will not be obtained. Carrot seed needs a well-made seed bed with a fine tilth if good germination is to be achieved. The earliest sowings can be made of an early maturing variety in a cold frame or greenhouse in January or February, this will provide edible roots in late spring. The first outdoor sowings are made as the soil warms up in the spring. Successional sowings can be made until early summer if required. A September sowing in mild areas can provide an early spring supply of young roots, though the plants will often require some protection.

nwatta Prefers a good light warm well-drained soil and plenty of moisture[16, 27, 37, 200]. Prefers a sandy or calcareous loam[132]. Plants are extremely sensitive to soil conditions, good roots can only be produced in a soil that permits easy penetration of the root[200]. Carrots are reported to tolerate an annual precipitation in the range of 31 to 410cm, an annual temperature range of 3.6 to 28.5°C and a pH of 4.2 to 8.7[269]. They prefer a pH in the range 6.5 to 7.5[200]. Carrots are widely cultivated in most areas of the world for their edible root, which can be available all year round from successional sowings[46]. There are many named varieties, with roots varying in size and shape from short and round to long and tapering[183, 200]. World-wide, the yields of roots averages about 24 tonnes per hectare, the world low production yield was 3,125 kg/ha in Zaire, whilst the world high production yield was 62,889 kg/ha in Belgium-Luxembourg[269]. Plants grow best at a mean temperature of 16 - 18°C. At temperatures above 28°C top growth is reduced and the roots become very strongly flavoured. At temperatures below 16°C the roots become long and tapered and are pale in colour[200]. The leaves are moderately susceptible to frost but the roots are much harder and can safely be left in the ground in the winter in most areas[200], so long as pests such as slugs or root fly are not a problem[K]. If dug up for storage, the roots can be kept for up to six months at 0 - 1°C and high relative humidity[200]. Carrots are very susceptible to a number of pests and diseases. The young seedlings are adored by slugs and so will generally need some protection. Carrot root fly is also a major problem. This creature lays its eggs near the young carrots. When they hatch, the larvae burrow into the soil and then eat their way into the root. In bad seasons almost all the crop can be heavily damaged. It is possible to reduce this damage by timing seed sowing to try and avoid the worst times of infestation, a June sowing of a fast-maturing cultivar will often be successful. There are also various companion plants that can help to reduce infestation. In general, these are strong-smelling plants such as garlic, onions and various aromatic plants such as wormwood. The idea is that these plants will mask the smell of the carrots and therefore the fly, which mainly uses scent to find the plants, will not be able to detect the smell of the carrots This method is most likely to fail when the fly comes close enough to the plants to see them and then no longer relies on scent. The most successful organic solution to date has been to erect barriers of clear polythene about 1 metre tall all around the bed of carrots. Since the fly generally flies below this height, it has proved to be quite effective, although any fly that does get in will then tend to stay inside the barrier and lay all of its eggs there. About 95% of carrot flowers are pollinated by insects, with the remaining 5% self-pollinating[269]. Carrots grow well with lettuce and chives[18] but dislike dill[20]. They also grow badly with potatoes, kohlrabi, fennel and cabbages[201]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.29 Hemerocallis middendorffii esculenta

4 tlin 8 cyuc 5 kcaak 0 tcan 1 dwat m hkuc hmihtmut cyutli kyuctucup hwicli hrasjnutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis middendorffii esculenta is a

on wounds, thus speeding up the healing process, and has been used as a cosmetic to remove freckles[7].

propta Harvest bulbils in late summer and replant immediately or store them in a cool dry frost-free place and plant them out in late winter or early spring. Division of the bulbs after the leaves die down in late summer.

nwatta Prefers a sunny position in a light well-drained soil[1] but succeeds in most soils that are in good condition[16]. Tolerates a pH in the range 4.5 to 8.3. The bulbs should be planted fairly deeply[1]. Some modern works have moved this plant from *A. cepa*, seeing it as being of hybrid origin with *A. fistulosum* and therefore renaming in *A. x proliferum*. The tree onion is a genuinely perennial form of *A. cepa* that is sometimes grown in the herb garden for its edible bulbils. Plants rarely if ever produce seed, instead the flowering head is comprised of a number of small onions or bulbils[16, 33]. Plants are propagated by means of these bulbils or by dividing the main bulb that grows underground[K]. By no means a heavily productive plant, though the bulbils are very well flavoured and the plant is fairly easily grown[K]. Its main problem is that slugs seem to be attracted to it and can eat to death even well-established plants[K]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Said to be immune to onion root fly[16]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 12 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

## 5.2.26 Malva alcea

Vervain mallow, Hollyhock Mallow

4 tin 8 cyuc 5 kcaak 2 tcan 1 dwat 1.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Malva alcea is a PERENNIAL growing to 1.2 m (4ft) by 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil SeedEdible Uses: Oil OilLeaves - raw or cooked[74]. A mild pleasant flavour[K]. The leaves are mucilaginous and fairly bland, this is a very good perennial substitute for lettuce in a salad, producing fresh leaves from spring until the middle of summer, or until the autumn from self-sown plants[K]. Flowers - raw[K]. A very decorative addition to the salad bowl, they have a mild flavour and a texture similar to the leaves[K]. Seed - raw[74]. Best used before it is fully mature, the seed has a pleasant nutty taste but it is rather small and fiddly to harvest[K].

tcanta Dye Fibre Oil OilA fibre obtained from the stem is used for making cordage[74]. Cream, yellow and green dyes can be obtained from the plant and the seed heads[168]. The seed yields 15% oil[74]. The uses of this oil have not been given though it is almost certainly edible[K].

dwatta Demulcent MouthwashThe leaves are demulcent. They are also used as a mouthwash for inflammatory and catarrhal conditions[74].

propta Seed - best sown in early spring in a cold frame. The seed germinates quickly and easily. Prick out the seedlings into individual pots when they are large enough

to handle and plant them out in their permanent positions in the early summer[K]. If you have sufficient seed then it can be sown outdoors in situ in the middle to late spring. Basal cuttings in late spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Container, Massing. A very easily grown plant, succeeding in ordinary garden soil[1], though it prefers a reasonably well-drained and moderately fertile soil in a sunny position[200]. A very ornamental and polymorphic plant[1, 50]. It tends to be quite short-lived in cultivation but usually self-sows when well-sited[233, K]. It is closely related to *M. excisa*[74]. If the plant is cut back to the ground as it comes into flower, then it will produce a fresh flush of leaves for salads[K]. Plants seem to be immune to the predations of rabbits[233] and are seldom bothered by slugs[K]. Plants are prone to infestation by rust fungus[200]. Special Features: Not North American native, Naturalizing, Extended bloom season in Zones 9A and above. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.2.27 Corylus maxima

Filbert, Giant filbert

4 tin 8 cyuc 5 kcaak 5 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwisslip hpa7tmwatli fyif hjonli

drutta Corylus maxima is a deciduous Shrub growing to 6 m (19ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil Oil SeedEdible Uses: Milk Oil OilSeed - raw or cooked[22, 34, 46, 105]. It is rich in oil. Large and well flavoured, it can be eaten raw, cooked in cakes, pies, breads etc or used to make a plant milk[183]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta Basketry Charcoal Hedge Oil Oil WoodThe seed contains up to 65% of a non-drying oil, used in paints, cosmetics etc[13, 46, 57, 132]. The whole seed can be used to polish and oil wood[6]. Very easy and effective[K]. Plants can be grown as a tall hedge[29]. They need to be left untrimmed or only lightly trimmed if seed is required. Wood - soft, easy to split, not very durable, beautifully veined. Used for inlay work, small items of furniture, hurdles, wattles, basketry, pea sticks etc[7, 13, 23, 46, 61, 63, 66, 125]. The twigs are used as dowling rods by water diviners[11]. The wood also yields a good quality charcoal, used by artists[63, 101].

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick

be grown if seed is required. The sexes of plants cannot be distinguished before flowering, but on flowering plants the buds of male plants in winter are conical and conspicuous whilst female buds are smaller and rounded[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 5.1.3 Amphicarpaea bracteata

Hog Peanut, American hogpeanut

tfozn 4 tin 9 cyuc 5 kcaak 3 tcan 1 dwat 1.5 m hkuc  
pccimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Amphicarpaea bracteata is a PERENNIAL CLIMBER growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from May to October, in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Root SeedEdible Uses: Seed - raw or cooked[2, 161]. Two types of seed are produced - flowers produced near the ground produce a pod that buries itself just below soil level. These pods contain a single seed are up to 15mm in diameter which can be used as a peanut substitute. They can be harvested throughout the winter and can be eaten raw or cooked[2, 63, 95, 161]. They are sweet and delicious raw with a taste that is more like shelled garden beans than peanuts[183]. Yields are rather low, and it can be a fiddle finding the seeds, but they do make a very pleasant and nutritious snack[K]. Other flowers higher up the plant produce seed pods that do not bury themselves. The seeds in these pods are much smaller and are usually cooked before being eaten[95, 183]. They can be used in all the same ways as lentils and are a good source of protein[K]. The overall crop of these seeds is rather low and they are also fiddly to harvest[K]. Root - cooked[177, 257]. The root is peeled, boiled and then eaten[257]. Fleshy and nutritious according to one report[200], whilst another says that the root is too small to be of much importance in the diet[257]. Our plants have only produced small and stringy roots[K].

tcanta Nitrogen Fixer:

dwatta An infusion of the root has been used in the treatment of diarrhoea[257]. Externally, the root has been applied to bites from rattlesnakes[257]. A poultice of the pulverized leaves has been applied with any salve to swellings[257].

propta Seed - pre-soak for 12 hours in warm water and then sow in spring in a semi-shaded position in a greenhouse. Germination usually takes place within a few weeks. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter, planting them out in late spring or early summer. Division. We have been unable to divide this plant because it only makes a small taproot. However, many of the seeds are produced under the ground and these can be harvested like tubers and potted up to make more plants.

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Understory legume Historic Crop Management: Fodder Management: Standard Staple Crop: ProteinRequires a moist humus-rich soil in a shady position[200]. The young shoots in spring can be damaged by late frosts[K]. The hog peanut has occasionally been cultivated for its edible seed which has been used as a peanut substitute[183]. Yields at present, however, are rather low[K]. Two types of blossom are produced by the plant - those produced from the leaf axils mostly abort but a few seeds are produced[95]. Solitary, inconspicuous cleistogamous flowers are produced on thread-like stems near the root and, after flowering, the developing seedpods bury themselves into the soil in a manner similar to peanuts[95, 274]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc.

and size shown above) information on the habit and root pattern is also useful and given here if available. A self-seeding plant [1-2]. Growth habit is herbaceous. Growth habit is a single or multiple shooting vine from a crown [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.1.4 Psoralea esculenta

Breadroot, Large Indian breadroot

tfozn 4 tin 8 cyuc 5 kcaak 3 tcan 1 dwat 0.3 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Psoralea esculenta is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Oil RootEdible Uses: OilRoot - raw or cooked[2, 4, 46, 57, 161]. It can also be dried for later use[183]. The dried root can be ground into a powder and used with cereals in making cakes, porridges etc[183]. Starchy and glutinous, the raw root is said to have a sweetish turnip-like taste[183]. The plant is best harvested as the tops die down at the end of the growing season[85]. This food is a staple and also considered to be a luxury item by many native North American Indian tribes[2, 61]. The root contains about 70% starch, 9% protein and 5% sugars[95].

tcanta Oil Soil stabilizationThe plant is a good soil stabilizer in its natural environment[200].

dwatta Pectoral Poultice StomachicAn infusion of the dried roots has been used in the treatment of gastro-enteritis, sore throats and chest problems[257]. The roots have been chewed by children as a treatment for bowel complaints[257]. A poultice of the chewed roots has been applied to sprains and fractures[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in early to mid spring in a greenhouse. Either sow the seed in individual pots or pot up the young seedlings as soon as possible in order to avoid root disturbance. Grow them on in the pots until planting out in their final positions. It is usually impossible to transplant this species without fatal damage to the root[200]. Division in spring. With great care since the plant resents root disturbance. It is virtually impossible to divide this species successfully[200].

nwatta Succeeds in an ordinary garden soil[1]. Requires a well-drained soil in a sunny position[200]. Plants are very intolerant of root disturbance, they are best planted out into their permanent positions whilst still small[200]. This plant has been recommended for improvement through breeding and selection for its edible root[183]. It was sent to Europe around the year 1800 as a potential food crop but was not well received[213]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.1.5 Elaeagnus orientalis

Trebizonid Date

tfozn 4 tin 8 cyuc 4 kcaak 2 tcan 2 dwat 12 m hkuc  
htut cyutli htakkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Elaeagnus orientalis is a deciduous Shrub growing to 12 m (39ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils,

prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Fruit **SeedEdible Uses:** Fruit - raw or cooked[3, 105]. Sweet and mealy but of better quality than the closely related *E. angustifolia*[183]. Eaten fresh or made into sherbet and preserves. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The oval fruit is about 10mm long and contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

**tcanta Hedge HedgePlants** can be grown as a hedge in exposed positions, tolerating maritime exposure.

**dwatta Cancer**The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

**propta Seed** - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, October/November in a frame[200]. The cuttings are rather slow and difficult to root, leave them for 12 months[113]. Layering in September/October. Takes 12 months[78].

**nwatta Succeeds** in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in very poor soils and in dry soils[11, 200]. Established plants are very drought resistant[1]. Prefers a light sandy loam and a sunny position[11, 200]. Dislikes shallow chalk soils[98]. Very closely related to *E. angustifolia* and often considered to be no more than a sub-species of it[183], it does not flower so freely in Britain as that species[11]. This species is notably resistant to honey fungus[88, 200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. The flowers are very fragrant and are rich in nectar[183], they are much visited by bees. Occasionally cultivated for its edible fruit, there are some named varieties[183]. The fruit used to be commonly sold in the markets of Iran and Turkey but is rarely found there nowadays[183].

## 5.1.6 Vicia faba major

Broad Bean, Fava Bean

tf0zn 4 tlin 10 cyuc 4 kcak 3 tcan 1 dwat m hkuc hmhmhtup cyutli hgattcup hwicli hrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

**drutta Vicia faba major** is a ANNUAL growing to 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Leaves **SeedEdible Uses:** Immature seed - raw or cooked. Broad bean seeds are very nutri-

tious and are frequently used as items of food. The seeds can be eaten raw when they are small and tender, as they grow older they can be cooked as a vegetable[2

, 7  
, 16  
, 132  
, 183

]. They have a very pleasant floury taste[K]  
]. There are some potential problems to the use of these seeds if they are consumed in large quantities[7  
] - see the notes above on toxicity.

Mature seeds can be eaten cooked as a vegetable or added to soups etc[2

, 7  
, 16  
, 183

]. They are best soaked for 12 - 24 hours prior to cooking in order to soften them and reduce the cooking time[K

]. They will also become more nutritious this way[K

]. The flavour is mild and pleasant with a floury texture[K

]. They can also be dried and ground into a flour for use in making bread etc with cereal flours[183

]. The seed can also be fermented to make tempeh[183

]. Made into a paste, they can be used as a sandwich filling[299

]. The seed can be sprouted before being cooked[183

]. Popped seeds can be salted and eaten as a snack or roasted like peanuts[183

].  
Young pods - cooked and eaten as a vegetable[183

]. They quickly become fibrous as they grow larger[183

], and also develop a hairy coating inside the pods that can become unpleasant as the pods get larger[K

].

Young leaves - cooked. They are very nutritious and can be used like spinach[105

, 183  
].

**tcanta Fibre Soap makingAgroforestry Uses:** The stems and leaves are sometimes used as a green manure[299 ]. Broad beans grow well with carrots, cauliflower, beet, cucumber, cabbages, leeks, celeriac, corn and potatoes, but is inhibited by onions, garlic and shallots[18 , 20 ]. Other Uses: A fibre is obtained from the stems. The burnt stems are rich in potassium and can be used in making soap. The dried stems can be burnt as a fuel[299 ].

**dwatta Diuretic**The seedpods are diuretic and lithontriptic[7].

**propta Pre-soak** the seed for 24 hours in warm water and then sow in situ in succession from late winter until early summer. Germination should take place in about 7 - 10 days. The earlier sowings should be of suitably hardy varieties such as the 'Longpods' whilst later sowings can be of the tastier varieties such as the 'Windsors'. By making fresh sowings every 3 weeks you will have a continuous supply of fresh young seeds from early summer until early autumn. If you want to grow the beans to maturity then the seed needs to be sown by the middle of spring. You may need to protect the seed from the ravages of mice. Another sowing can be made in middle to late autumn. This has to be timed according to the area where the plants are being grown. The idea is that the plants will make some growth in the autumn and be perhaps 15 - 20cm tall by the time the colder part of winter sets in. As long as the winter is not too severe, the plants should stand well and will grow away rapidly in the spring to produce an earlier crop. The plants will also be less likely to be attacked by blackfly. Make sure you choose a suitably hardy variety for this sowing.

**nwatta** Broad beans originated in warm temperate areas and can be cultivated from the cold temperate zone to the subtropics, and also at higher elevations from 1,300 - 3,800 metres in the tropics. It may flower well in the lowland tropics, but usually does not produce pods[299

]. The ideal temperature range in the growing season is between 18 - 27°C, at higher temperatures the flowers are often aborted[200

]. The plant requires an annual rainfall of 700 - 1,000mm, of which more than 60% should occur during the growing period[299

]. Prefers a fairly heavy loam but succeeds in a sunny position in most soils that are well-drained[1

heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.24 Ribes uva

Gooseberry, European gooseberry

4 tlin 8 cyuc 5 kcak 2 tcan 1 dwat 1.2 m hkuc hmhmhtup cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

**drutta Ribes uva-crispa** is a deciduous Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to May, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit **LeavesEdible Uses:** Fruit - raw or cooked[1, 2, 5, 7, 61]. The fruit is often picked when under-ripe and very firm, it has a very tart flavour at this time and is mainly used in making pies, jams etc. However, if the fruit is allowed to remain on the plant until it is fully ripe and soft it becomes quite sweet and is delicious for eating out of hand[K]. The fruit of the wild species is often less than 1cm in diameter, but named cultivars have considerably larger fruits up to 3cm in diameter[K]. Leaves- raw. The young and tender leaves can be eaten in salads[4]. Some caution is advised, see the notes above on toxicity.

**tcanta Cosmetic Miscellany**The fruit pulp is used cosmetically in face-masks for its cleansing effect on greasy skins[7].

**dwatta Astringent Dysentery Laxative Miscellany**The fruit is laxative[7]. Stewed unripe gooseberries are used as a spring tonic to cleanse the system[4]. The leaves have been used in the treatment of gravel[4]. An infusion taken before the monthly periods is said to be a useful tonic for growing girls[4]. The leaves contain tannin and have been used as an astringent to treat dysentery and wounds[7].

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

**nwatta** Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Growth is often poor in light soils, whilst heavy soils encourage soft growth and excess vigour[200]. Prefers a pH in the range 6 to 6.5[200], though it can grow well in more acid or alkaline soils[K]. It is important to add plenty of humus to chalky soil[K]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. They can be grown against east or north facing walls[37]. The fruit of plants on north facing walls will ripen later, thus extending the fruiting season, though yields will be lower[K]. Plants dislike very hot weather[37]. Dormant plants are hardy to about -20°C[200], but the flowers and young fruits are susceptible to frost damage. Plants are very susceptible to potash deficiency[1], especially when grown on alkaline soils[K]. Gooseberries are commonly cultivated in temperate regions for their edible fruit, there are many named varieties[183, 200]. Birds love the fruit and so some protection is often required, especially if the fruit is being grown to full ripeness[K]. Plants grow best in cool moist climates such as N. Europe[200]. Plants fruit

best on one and two year old wood so any pruning should be to encourage vigorous new shoots[200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.25 Allium cepa proliferum

Tree Onion, Walking Onion

4 tlin 8 cyuc 5 kcak 3 tcan 3 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta Allium cepa proliferum** is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves **RootEdible Uses:** The plant forms small bulbs at the top of the flowering stem, these can be eaten raw or cooked[16, 33]. They have a strong onion flavour and are often used as pickled onions or added to salads[K]. As long as the bulbs are dried properly at harvest time, they store well[4]. Bulb - raw or cooked. The bulb can be up to 4cm in diameter and has a strong onion flavour[K]. Chopped into slices, it makes a good addition to salads and can also be used as a vegetable or as a flavouring in cooked foods[K]. Leaves - raw or cooked. A strong onion flavour, it makes a nice flavouring in salads though it should not be harvested in quantity because this would reduce the yield of bulbs[K]. The leaves are produced from late autumn, though we have found that harvesting them at this time will often encourage diseases such as mildew[K].

**tcanta Cosmetic Dye Hair Polish Repellent Rust**The juice of the plant is used as a moth repellent and can also be rubbed onto the skin to repel insects[7]. The plant juice can be used as a rust preventative on metals and as a polish for copper and glass[7]. A yellow-brown dye is obtained from the skins of the bulbs[141, 168]. Onion juice rubbed into the skin is said to promote the growth of hair and to be a remedy for baldness[7]. It is also used as a cosmetic to get rid of freckles[7]. The growing plant is said to repel insects and moles[201]. A spray made by pouring enough boiling water to cover 1kg of chopped unpeeled onions is said to increase the resistance of other plants to diseases and parasites[201].

**dwatta Anthelmintic Antiinflammatory Antiseptic Antispasmodic Carminative Diuretic Expectorant Febrifuge Hypoglycaemic Hypotensive Lithontriptic Skin Stomachic Tonic**Although rarely used specifically as a medicinal herb, the onion has a wide range of beneficial actions on the body and when eaten (especially raw) on a regular basis will promote the general health of the body. The bulb is anthelmintic, anti-inflammatory, antiseptic, antispasmodic, carminative, diuretic, expectorant, febrifuge, hypoglycaemic, hypotensive, lithontriptic, stomachic and tonic[4, 7, 21]. When used regularly in the diet it offsets tendencies towards angina, arteriosclerosis and heart attack[254]. It is also useful in preventing oral infection and tooth decay[254]. Baked onions can be used as a poultice to remove pus from sores[254]. Fresh onion juice is a very useful first aid treatment for bee and wasp stings, bites, grazes or fungal skin complaints[7, 201]. When warmed the juice can be dropped into the ear to treat earache[254]. It also aids the formation of scar tissue

one year old wood. Pruning usually consists of removing about a third of all the stems from just above ground level in the autumn. The oldest stems with least new growth are removed since these will be the poorest fruiterers. The plant is able to make new growth from the base of the removed stems and, if the plants are well fed, this growth is very vigorous and will fruit heavily the following year. The flowers can self-fertilize but many cultivars fruit better with insect pollination[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 5.2.22 Hemerocallis middendorffii

Amur daylily, Middendorf, Daylily

4 tlin 8 cyuc 5 kcaak 2 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjltutnykfrp hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis middendorffii is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves ShootsEdible Uses: Leaves and young shoots - cooked[105, 116, 177, 183]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177, 183]. The flowers can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Plants form a spreading clump and are suitable for ground cover when spaced about 45cm apart each way[208]. The dead leaves should be left on the ground in the winter to ensure effective cover[208]. (This report was for a plant labelled H. middendorffiana, which I have assumed is a mis-spelling of this species[K]). Attractive flowers.

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Seashore. Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. Individual flowers are short-lived, but the plant produces a succession of blooms and also flowers again in late summer[205]. The plant has a fibrous root system

that does not extend far[205]. Plants take a year or two to become established after being moved but then form large clumps[200, 187]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. Special Features: Attractive foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

## 5.2.23 Amelanchier stolonifera

Quebec Berry, Running serviceberry

4 tlin 8 cyuc 5 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjltutnykfrp hpa7tli frus-flatprik hpa7tmwatli fyfxc7t hjonli

drutta Amelanchier stolonifera is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[3, 101, 105]. Sweet and juicy with a good flavour that has a hint of apple[1, 11, 183, K]. The plant usually yields very well in Britain and the well-flavoured fruit means that it has excellent potential as a commercial crop[K] The fruit is rich in iron and copper[226].

tcanta None known dwatta TonicThe root bark has been used as a tonic[257].

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Dislikes calcareous soils[11]. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too water-logged[11]. Grows well in heavy clay soils. Tolerates dry soils[200]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Produces suckers quite freely, the plant forms thickets. When propagated by these suckers, the new plants can begin producing a crop of fruit in their second year[K]. The sub-species A. stolonifera micropetala was seen growing in dappled shade at Hilliers Arboretum in early April 1999. It was about 2 metres tall, suckering freely with some suckers more than 50cm from the parent plant, and flowering freely[K]. Hybridizes with A. arborea, A. bartramiana, A. laevis and A. sanguinea. Grafting onto seedlings of A. lamarkii or Sorbus aucuparia is sometimes practised in order to avoid the potential problem of hybridizing[1]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more

, 200  
1. Grows well in heavy clay soils. Dislikes dry conditions according to some reports[87

, 200  
1. whilst another says that it is drought tolerant once established[132

1. Prefers a pH in the range 5.5 to 7[200  
1. There are two main forms of this species - small seeded forms that are more commonly grown for feeding livestock and as a green manure, and larger seeded forms that are usually grown for human food. Of the larger seeded forms there are two main types: 'Longpod' beans are the more hardy and can be sown in the autumn in cool temperate areas. 'Windsor' beans, which are considered to be finer flavoured, are less tolerant of the cold and so are best sown in spring[132

1. Autumn sown varieties are more susceptible to 'chocolate spot' fungus, this problem can be alleviated by the addition of potash to the soil[87

1. Black fly can be a major problem. Autumn sown crops are less likely to be affected. Pinching out the soft tips of the plants, one they are tall enough and are beginning to flower, can reduce the problem since the blackfly always start on the soft shoots and then spread to the older stems. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200

1. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

## 5.1.7 Caragana brevispina

Long-Stalked Pea-shrub

tfo2n 4 tlin 9 cyuc 4 kcaak 3 tcan 1 dwat 2.5 m hkuc htut cyutli hgatkyuctcup hwicli hyshrasjltut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Caragana brevispina is a deciduous Shrub growing to 2.5 m (8ft) by 1.8 m (6ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked[160]. Small but produced in abundance. The seed of a plant seen at the Royal Horticultural Gardens, Wisley in Surrey in September 1993 was about twice the size of C. arborescens but it had a distinctly bitter taste[K]. High in protein, it has been recommended as an emergency food for humans. Young buds - cooked as a green vegetable[272].

tcanta Hedge Hedge Soil stabilization WoodPlants can be grown as a hedge, they are very spiny and provide an impenetrable barrier. The extensive root system of this plant makes it useful for planting to control soil erosion. Wood - hard, close grained[146]. An important fuel wood for people living at high elevations[272].

dwatta A decoction of the plant is taken in the treatment of aching joints[272].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Succeeds in most well-drained soils, but prefers full sun and a light sandy dry or well-drained soil[1, 11, 200]. Does not require a rich soil[11], succeeding on marginal

land[160]. Succeeds in acid or alkaline soils[160]. Established plants are drought resistant[160]. This species is hardy to at least -20°C[184], it prefers a continental climate with hot summers and cold winters so it does not grow so well in the milder western half of Britain[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.8 Medicago sativa

Alfalfa, Yellow alfalfa

tfo2n 4 tlin 8 cyuc 4 kcaak 4 tcan 3 dwat 1 m hkuc htut cyutli hgatkyuctcup hwicli hyshrasjltutnyk hpa7tli flat-prikliwis hpa7tmwatli fyfxc7t hjonli

drutta Medicago sativa is a PERENNIAL growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Oil TeaLeaves and young shoots - raw or cooked[2, 8, 52, 145]. The leaves can also be dried for later use[55]. Very rich in vitamins[183], especially A, B and C[201], they are also a good source of protein[206]. The leaves are a rich source of vitamin K[213]. A very nutritious food in moderation, though it can trigger attacks in patients with systemic lupus erythematosus and large quantities can affect liver function and cause photosensitization[238]. A nutritional analysis is available[218]. The seed is commonly used as a sprouted seed which is added to salads[2, 20, 52], used in sandwiches etc or cooked in soups[183]. The seed is soaked in warm water for 12 hours, then kept moist in a container in a warm place to sprout. It is ready in about 4 - 6 days[244]. The seeds can also be ground into a powder and used as a mush, or mixed with cereal flours for making a nutritionally improved bread etc[183, 213, 244]. Seed yields average around 186 - 280 kilos per hectare[269]. An appetite-stimulating tea is made from the leaves[21, 55], it has a flavour somewhat reminiscent of boiled socks[144] and is slightly laxative[159].

tcanta Biomass Companion Dye Green manure Hedge Hedge Oil PaperOften grown as a green manure. It is a bit slow to establish in its first year so is generally only recommended for positions where it can remain for 2 or more years. Alfalfa is very vigorous from its second year, producing a huge bulk of material that can be cut down 2 or 3 times during the season[20, 87]. Plants are very deep rooting, descending 6 metres or more into the soil[200], and are able to fix large quantities of atmospheric nitrogen, this makes them one of the very best green manures. Plants are rather intolerant of competition from grass etc, however, and there is the drawback of needing to leave them in the soil for more than 2 years to fully achieve their potential[K]. Alfalfa is a potentially excellent source of biomass. It is possible to produce more than 2 tonnes of protein from the leaves (suitable for human use) per hectare per year. In addition, the plant residues remaining could be used to produce the equivalent of about 10 barrels of oil per year[269]. A yellow dye is obtained from the seed[269]. The fibre of the plant has been used in making paper[269]. The seed yields about 8.5 - 11% of a drying oil. It is used in paints, varnish etc[46, 57, 61, 269]. The plant can be grown as a low dividing hedge in the vegetable garden[52, 206]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anodyne Antibacterial Antiscorbutic Aperient Diuretic Emetic Fibrifuge Haemostatic Hypoglycaemic Nutritive Stimulant TonicAlfalfa leaves, either fresh or dried, have traditionally been used as a nutritive tonic to stimulate the appetite and promote weight gain[222]. The plant has an oe-

strogenic action and could prove useful in treating problems related to menstruation and the menopause[254]. Some caution is advised in the use of this plant, however. It should not be prescribed to people with auto-immune diseases such as rheumatoid arthritis[238]. See also the notes above on toxicity. The plant is antiscorbatic, aperient, diuretic, oxyctic, haemostatic, nutritive, stimulant and tonic[55, 165, 218]. The expressed juice is emetic and is also anodyne in the treatment of gravel[218]. The plant is taken internally for debility in convalescence or anaemia, haemorrhage, menopausal complaints, pre-menstrual tension, fibroids etc[238]. A poultice of the heated leaves has been applied to the ear in the treatment of earache[257]. The leaves can be used fresh or dried[238]. The leaves are rich in vitamin K which is used medicinally to encourage the clotting of blood[213]. This is valuable in the treatment of jaundice[213]. The plant is grown commercially as a source of chlorophyll and carotene, both of which have proven health benefits[222]. The leaves also contain the anti-oxidant tricin[222]. The root is febrifuge and is also prescribed in cases of highly coloured urine[218]. Extracts of the plant are antibacterial[218]. Used for asthma, diabetes, gastrointestinal disorders (anti-ulcer) [301].

propta Pre-soak the seed for 12 hours in warm water and then sow in spring in situ. The seed can also be sown in situ in autumn[52]. Seed can be obtained that has been inoculated with Rhizobium bacteria, enabling the plant to succeed in soils where the bacteria is not already present.

nwatta Global Crop Management: Hay Staple Crop: ProteinAlfalfa is a very versatile plant that can adapt to a wide range of climatic conditions from cold temperate to warm sub-tropical.[269]. It succeeds on a wide variety of soils[52, 269], but thrives best on a rich, friable, well-drained loamy soil with loose topsoil supplied with lime[269]. It does not tolerate waterlogging and fails to grow on acid soils[269]. Grows well on light soils[206]. The plant has a deep taproot and, once established, tolerates drought and extremely dry conditions[52, 269]. Prefers a neutral fertile soil[87] but succeeds in relatively poor soils so long as the appropriate Rhizobium bacteria is present[200]. A good bee plant[46] and a food plant for many caterpillars[30]. Alfalfa is a very deep rooting plant, bringing up nutrients from deep in the soil and making them available for other plants with shallower root systems. It is a good companion plant for growing near fruit trees and grape vines so long as it is in a reasonably sunny position, but it does not grow well with onions or other members of the Allium genus[201]. Growing alfalfa encourages the growth of dandelions[201]. Alfalfa has long been cultivated for its edible seed, which can be sprouted and eaten in salads. It is also grown as a green manure and soil restorer. There are many named varieties[183]. Botanists divide the species into a number of sub-species - these are briefly described below: - *M. sativa caerulea* (Less. ex Ledeb.)Schmalh. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought resistance and salt tolerance to alfalfa. *M. sativa falcata* (L.)Arcang. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought and disease resistance plus salt and water-logging tolerance to alfalfa. *M. sativa sativa*. The commonly cultivated form of alfalfa. *M. sativa varia* (Martyn.)Arcang. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought resistance and high yields to alfalfa. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.1.9 Desmanthus illinoensis

Prairie Mimosa, Illinois bundleflower  
tfo2n 4 tlin 8 cyuc 4 kcaak 1 tcan 1 dwat 1.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnykifrp hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Desmanthus illinoensis is a PERENNIAL growing to 1.3 m (4ft 3in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. Rich in protein but without much flavour[183]. The seed-pods are about 25mm long and contain 3 - 5 small seeds[235]. They are freely borne in the plants native environment, but will have to be very freely produced in this country if it is to be a worthwhile crop[K].

tcanta Root bark of *D. illinoensis* has been found to contain N,N-DMT, NMT, N-hydroxy-N-methyltryptamine, 2-hydroxy-N-methyltryptamine, and gramine (toxic). The root bark is mixed with a native source of beta-Carbolines to produce a hallucinogenic drink called prairiehuasca, which is an analog of the shamanic brew ayahuasca.

dwatta Antipruritic OphthalmicA leaf tea has been used in the treatment of itchy skin[222, 257]. Five seeds have been placed in the eye at night and washed out in the morning to treat trachoma[257].

propta Seed - pre-soak for 12 hours in warm water and then sow in a cold frame in the spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in early summer. If you have sufficient seed then it is probably worthwhile sowing some in situ in mid to late spring.

nwatta Agroforestry Services: Nitrogen Management: Standard Staple Crop: Protein Under DevelopmentRequires a moist but well-drained soil in full sun[200]. Plants are often found growing in clay soils in the wild[274]. Suitable for the wild garden or other naturalistic plantings[200]. In favourable situations this plant can self-sow to the point of nuisance[200]. This plant is being evaluated by the Land Institute of Salina, Kansas, as an edible legume for growing with perennial grains in a non-tillage permaculture system[183]. It is certainly worthy of more attention in this country, though the small seed size mitigates against its use[K]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.10 Psoralea hypogaea

Small Indian Breadroot  
tfo2n 4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.1 m hkuc  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Psoralea hypogaea is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[2, 62, 85, 161, 257]. Rich in starch[105]. The root can also be dried, ground into a powder and used in soups or with cereals for making bread etc[161]. The root is up to 60mm long and 15mm thick[60]. The root was an important food source fr the native North American Indians[274].

tcanta Soil stabilizationThe plant is a good soil stabilizer in its natural environment[200].

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early to mid spring in a greenhouse. Either sow the seed in individual pots or pot up the young seedlings

The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2]. Heat zone: 9-1.

## 5.2.20 Allium canadense mobilense

Canadian Garlic  
4 tlin 8 cyuc 5 kcaak 0 tcan 2 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Allium canadense mobilense is a BULB growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[46, 61, 62, 177]. It can be used as a vegetable, or as a flavouring in soups and stews, and can also be pickled[2]. The bulb is up to 30mm in diameter, it is crisp, mild and with a pleasant flavour[183]. Used as a leek substitute according to one report[22], it is a garlic substitute according to others[55, 159, K]. Leaves - raw or cooked[55, 62, 177]. A delicious mild flavour, they are available from early spring until the autumn[K]. They make a very acceptable salad and can also be used as a greens or as a flavouring in cooked foods[K]. Flowers - raw. A little bit stronger flavour than the leaves, especially as the seeds begin to form, they can be used as a flavouring and garnish on salads[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Antiasthmatic Carminative Cathartic Diuretic Expectorant StimulantThe plant is antiasthmatic, carminative, cathartic, diuretic, expectorant and stimulant[257]. A tincture is used to prevent worms and colic in children, and also as a remedy for croup[257]. Although no other specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. A moisture loving plant according to another report[42]. The bulbs should be planted fairly deeply[1]. Bulbs grow to a good size under cultivation[183]. Some forms of this species produce many bulbs and are considered to be a pernicious weed in some areas of America[159], there is some risk that they could spread aggressively in Britain. This subspecies, however, is a form that does not produce bulbs and is much better behaved[200]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.21 Ribes nigrum

Blackcurrant, European black currant  
4 tlin 8 cyuc 5 kcaak 2 tcan 3 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Ribes nigrum is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from March to November, in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked. An excellent aromatic flavour[K]. The fully ripe fruit is very acceptable raw, though it is more often cooked and used to make pies, jams etc[1, 2, 5, 9, 34]. Very rich in vitamin C[244]. The fruit is about 10mm in diameter[200], though selected cultivars have larger fruits[K]. The leaves are used in soups[183]. The dried leaves are a tea substitute[74, 177, 183]. They are sometimes added to blended herb teas[238].

tcanta Cosmetic Dye Miscellany PreservativeThe oil from the seed is added to skin preparations and cosmetics. It is often combined with vitamin E to prevent oxidation[238]. A yellow dye is obtained from the leaves[100]. A blue or violet dye is obtained from the fruit[100]. The leaves are used for vegetable preservation[74]. No more details.

dwatta Antidiarrhoeal Antirheumatic Diaphoretic Diuretic Febrifuge Miscellany Vitamin CBlackcurrant fruits are a good source of minerals and vitamins, especially vitamin C. They have diuretic and diaphoretic actions, help to increase bodily resistance to infections and are a valuable remedy for treating colds and flu[4, 254]. The juice, especially when fresh or vacuum-sealed, helps to stem diarrhoea and calms indigestion[4, 254]. The leaves are cleansing, diaphoretic and diuretic[4, 9]. By encouraging the elimination of fluids they help to reduce blood volume and thereby lower blood pressure[254]. An infusion is used in the treatment of dropsy, rheumatic pain and whooping cough, and can also be used externally on slow-healing cuts and abscesses[9]. It can be used as a gargle for sore throats and mouth ulcers[254]. The leaves are harvested during the growing season and can be used fresh or dried[238]. It is believed that an infusion of the leaves increases the secretion of cortisol from the adrenal glands, and thus stimulates the activity of the sympathetic nervous system[254]. This action may prove useful in the treatment of stress-related conditions[254]. An infusion of the young roots is useful in the treatment of eruptive fevers[4]. A decoction of the bark has been found of use in the treatment of calculus, dropsy and haemorrhoidal tumours[4]. The seed is a source of gamma-linolenic acid, an unsaturated fatty acid which assists the production of hormone-like substances[238]. This process is commonly blocked in the body, causing disorders that affect the uterine muscles, nervous system and metabolism[238]. We have no records of the oil from this species being used medicinally, though it is used in cosmetic preparations[238, K].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Best grown on a deep sandy loam[11]. Dislikes very heavy clay, chalky soils and thin dry soils, but it can succeed on most soil types if plenty of organic matter is incorporated[1]. Plants require plenty of nitrogen if they are to do well[200]. Prefers a pH in the range 6.7 to 7 and is intolerant of acid soils[200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Plants fruit less freely when grown in windy sites[200]. The plant is hardy to about -20°C, though flowers are damaged at -1°C[200]. Blackcurrants are widely cultivated in temperate areas for their edible fruit, there are many named varieties[183, 200]. Most fruit is produced on



to do well in Britain[ 196 ]. Different cultivars take from 90 - 220 days from seed sowing to harvest[ 196 ]. Yields as high as 5 tonnes per hectare have been recorded in the Andes, which compares favourably with wheat in that area[ 196 ]. Young plants look remarkably like the common garden weed fat hen (*Chenopodium album*). Be careful not to weed the seedlings out in error! K J. The seed is not attacked by birds because it has a coating of bitter tasting saponins[ 141 , K J. These saponins are very easily removed by soaking the seed overnight and then thoroughly rinsing it until there is no sign of any soapiness in the water. The seed itself is very easy to harvest by hand on a small scale and is usually ripe in August. Cut down the plants when the first ripe seeds are falling easily from the flower head, lay out the stems on a sheet in a warm dry position for a few days and then simply beat the stems against a wall or some other surface, the seed will fall out easily if it is fully ripe and then merely requires winnowing to get rid of the chaff. Carbon Farming Solutions - Cultivation: hypothetical. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.18 Rubus laciniatus

Oregon Cut-Leaf Blackberry, Cutleaf blackberry 4 tin 8 cyuc 5 kcaak 1 tcan 0 dwat 2.5 m hkcuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rubus laciniatus is a deciduous Shrub growing to 2.5 m (8ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 34, 101, 257]. Large sweet and juicy with a fine flavour[11, 183]. The fruit is about 20mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. This species is a blackberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. The plant produces apomictic flowers, these produce fruit and viable seed without fertilization, each seedling is a genetic copy of the parent[200]. Sometimes cultivated for its edible fruit, it is a very vigorous and productive plant[3]. There is at least one named variety. 'Oregon Cutleaf Thornless' is high yielding with good flavoured fruits and no prickles on the stems, thus making it easier to harvest[17]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.19 Rubus idaeus

Raspberry, American red raspberry, Grayleaf red raspberry 4 tin 8 cyuc 5 kcaak 3 tcan 3 dwat 2 m hkcuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta Rubus idaeus is a deciduous Shrub growing to 2 m (6ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in leaf from April to November, in flower from June to August, and the seeds ripen from July to September.

The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Root Shoots StemEdible Uses: Coffee TeaFruit - raw or cooked[2, 5, 7, 61]. Delicious when eaten out of hand, the fruit is also used in pies, preserves etc[183]. Root - cooked. The root, which should be neither too young nor too old, requires a lot of boiling[7]. Young shoots - peeled and eaten raw or cooked like asparagus[172]. They are harvested as they emerge through the ground in the spring and whilst they are still tender. A herb tea is made from the dried leaves[21, 46, 183]. Another report says that a type of tea made from raspberry and blackberry leaves is an excellent coffee substitute[7].

tcanta Cosmetic Dye PaperLandscape Uses:Erosion control, Foundation, Ground cover, Massing, Rock garden, Seashore. ts in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Attracts butterflies, Inconspicuous flowers or blooms. A purple to dull blue dye is obtained from the fruit[168]. A fibre obtained from the stems is used in making paper[189]. The stems are harvested in the summer after the fruit has been eaten, the leaves are removed and the stems are steamed until the fibres can be stripped. The fibres are cooked for 2 hours with lye and then hand beaten with mallets or ball milled for 3 hours. The paper is light brown in colour[189]. A decongestant face-mask made from the fruit is used cosmetically to soothe the reddened skin[7].

dwatta Antiinflammatory Astringent Birthing aid Cardiac Decongestant OxytoxicAntiemetic[13, 165]. The leaves and roots are anti-inflammatory, astringent, decongestant, ophthalmic, oxytotic and stimulant[4, 13, 165, 222, 254]. A tea made from them is used in the treatment of diarrhoea, as a tonic for the uterus to strengthen pregnant women, and as an aid in childbirth[4, 222, 257]. The tea has also been shown as effective in relieving painful menstrual cramps[222]. The active ingredients both stimulate and relax the uterus[222]. They can be used during the last three months of pregnancy and during childbirth, but should not be used earlier[238]. Externally, the leaves and roots are used as a gargle to treat tonsillitis and mouth inflammations, as a poultice and wash to treat sores, conjunctivitis, minor wounds, burns and varicose ulcers[238, 257]. The leaves are harvested in the summer and dried for later use[9]. The fruit is antiscorbutic and diuretic[7]. Fresh raspberry juice, mixed with a little honey, makes an excellent refrigerant beverage to be taken in the heat of a fever[21]. Made into a syrup, it is said to have a beneficial effect on the heart[21].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Prefers a good deep well-drained loamy soil on the acid side[1, 34]. Dislikes very heavy soils[1, 200], light soils[4] and alkaline soils[200]. Prefers an open position but tolerates some shade[1]. Plants crop less well when grown in the shade of trees though they do well in the open on a north-facing slope[200]. Requires a position sheltered from strong winds[200]. Prefers a pH between 6 and 6.5[200]. Raspberries are frequently cultivated in temperate regions of the world, both in the garden and commercially, for their edible fruit. There are many named varieties able to supply fresh fruit from mid-summer to the autumn[1, 200]. High costs of picking the fruit means that little is actually sold fresh, most of the commercially cultivated crops either being used for preserves or grown for the 'Pick Your Own' trade. All the cultivars are self-fertile[200]. This species has biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. It is best not to grow raspberries near blackberries or potatoes[18]. PlanFor polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available.

as soon as possible in order to avoid root disturbance. Grow them on in the pots until planting out in their final positions. It is usually impossible to transplant this species without fatal damage to the root[200]. Division in spring. With great care since the plant resents root disturbance. It is virtually impossible to divide this species successfully[200].

nwatta Succeeds in an ordinary garden soil[1]. Requires a well-drained soil in a sunny position[200]. Plants are very intolerant of root disturbance, they are best planted out into their permanent positions whilst still small[200]. Some botanists have reclassified the plant and now call it *Pediomelum hypogaeum*[274]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.11 Hedysarum occidentale

Liquorice Root, Western sweetvetch tfo2n 4 tin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.1 m hkcuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Hedysarum occidentale is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[212]. Long and sweet with a liquorice-like flavour[183]. Used in the spring it is crisp and juicy' but it becomes tough and woody as the season advances.

tcanta None known

dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil in a sunny position, preferring a deep well-drained sandy loam[1, 200]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. This species is closely related to *H. boreale*[212]. Does well in the rock garden or border[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.12 Robinia pseudoacacia

Black Locust, Yellow Locust

tfo2n 4 tin 9 cyuc 3 kcaak 4 tcan 2 dwat 25 m hkcuc htut cyutli hgatkyuctup hwicli hyishrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Robinia pseudoacacia is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June, and the seeds ripen from November to March. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Oil Seed SeedpodEdible Uses: Condiment Drink OilSeed - cooked[2, 55, 61]. Oily[161]. They are boiled and used like peas[183]. After boiling the seeds lose their acid taste[213]. The seed is about 4mm long and is produced in pods up to 10cm long

that contain 4 - 8 seeds[82]. A nutritional analysis is available[218]. Young seedpods - cooked[105]. The pods contain a sweetish pulp that is safe to eat and is relished by small children[201]. (This report is quite probably mistaken, having been confused with the honey locust, *Gleditsia spp*[K].) A strong, narcotic and intoxicating drink is made from the skin of the fruit[13]. Piperonal is extracted from the plant, it is used as a vanilla substitute[105]. No further details. All the above entries should be treated with some caution, see the notes at the top of the page regarding toxicity. Flowers - cooked. A fragrant aroma, they are used in making jams and pancakes[7, 183]. They can also be made into a pleasant drink[183].

tcanta Dye Essential Fibre Fodder Fuel Oil Soil stabilization WoodAgroforestry Uses: This species has been widely planted for shelterbelts and windbreaks, and is also used to produce woody biomass for energy production[1050 ]. It suckers freely, especially if coppiced, and can be used for stabilizing banks etc[200 , 226 ]. It is used in restoration and rehabilitation projects because its extensive root system holds and stabilizes the soil surface, it sprouts vigorously and prolifically, it increases soil fertility through nitrogen fixation, and it forms a leaf litter that protects the soil. Its main use has been in the rehabilitation of former surface mine sites and for erosion control, but it is also used to rehabilitate contaminated soils, depleted soils, gravel pits, and logged areas, and to stabilize railroad embankments and highway edges[1050 ]. The plant is often found as a pioneer on old fields, burned areas, and lands strip-mined for coal[418 ]. The leaves are rich in tannin and other substances which inhibit the growth of other plants[13 ]. The flowers are a rich source of nectar. Honey produced from this nectar is considered to be of high quality and fetches a price premium. Other Uses: A drying oil is obtained from the seed[2 , 7 ]. An essential oil is obtained from the flowers. Highly valued, it is used in perfumery[7 , 57 , 100 ]. A yellow dye is obtained from the bark[223 ]. Robinetin is a strong dyestuff yielding with different mordants different shades similar to those obtained with fisetin, quercetin, and myricetin; with aluminum mordant, it dyes cotton to a brown-orange shade[269 ]. The bark contains tannin, but not in sufficient quantity for utilization[223 ]. On a 10% moisture basis, the bark contains 7.2% tannin and the heartwood of young trees 5.7%[223 ]. The bark is used to make paper and is a substitute for silk and wool[13 ]. The wood is close-grained, exceedingly hard, heavy, very strong (due to a high lignin content), resists shock and is very durable in contact with the soil. It weighs 45lb per cubic foot. It does not shrink much when drying. The wood is used in shipbuilding and for making fence posts, tree nails, flooring, furniture, woodenware etc[4 , 7 , 11 , 13 , 46 , 61 , 82 , 149 , 171 , 227 , 418 , 1050 ]. The wood of *Robinia pseudoacacia* var. *rectissima*, the so called 'Long Island' or 'Shipmast' locust, has a greater resistance to decay and wood borers, outlasting other locust posts and stakes by 50 - 100%[269 ]. A very good fuel[82 , 418 ], but it should be used with caution because it flares up and projects sparks[226 ]. The wood is also used for making charcoal[418 ]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antispasmodic Antiviral Aromatic Cancer Chologogue Diuretic Emetic Emollient Febrifuge Laxative Narcotic Purgative TonicFebrifuge[13, 46]. The flowers are antispasmodic, aromatic, diuretic, emollient and laxative[218]. They are cooked and eaten for the treatment of eye ailments[218]. The flower is said to contain the antitumor compound benzaldehyde[269]. The inner bark and the root bark are emetic, purgative and tonic[4, 7, 218, 257]. The root bark has been chewed to induce vomiting, or held in the mouth to allay toothache[222, 257], though it is rarely if ever prescribed as a therapeutic agent in Britain[4]. The fruit is narcotic[13]. This probably refers to the seedpod. The leaves are chologogue and emetic[7]. The leaf juice inhibits viruses[218].

propta Seed - pre-soak for 48 hours in warm water and sow the seed in late winter in a cold frame[80]. A short stratification improves germination rates and time[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in the following summer. Other reports say that the seed can be sown in an outdoor seedbed in spring[78, 98]. The seed stores for over 10 years[113]. Suckers taken during the dor-

mant season.

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Other Systems: SRC/Landscape Uses:Erosion control, Firewood, Aggressive surface roots possible. Succeeds in any well-drained soil, preferring one that is not too rich[1, 200]. Succeeds in dry barren sites, tolerating drought and atmospheric pollution[60, 200]. Succeeds in a hot dry position. The plant is reported to tolerate an annual precipitation in the range of 61 to 191cm, an annual temperature in the range of 7.6 to 20.3°C and a pH of 6.0 to 7.0[269]. A fast-growing tree for the first 30 years of its life[188, 269], it can begin to flower when only 6 years old, though 10 - 12 years is more normal[229]. The flowers are a rich source of nectar and are very fragrant[82] with a vanilla-like scent[245]. The branches are brittle and very liable to wind damage[200]. When plants are grown in rich soils they produce coarse and rank growth which is even more liable to wind damage[11, 200]. The plants sucker freely and often form dense thickets, the suckers have vicious thorns[226]. There are some named varieties selected for their ornamental value[188], some of these are thornless[226]. Any pruning should be done in late summer in order to reduce the risk of bleeding[200]. The leaves are rich in tannin and other substances which inhibit the growth of other plants[13]. A very greedy tree, tending to impoverish the soil[13]. (Although a legume, I believe it does not fix atmospheric nitrogen[K]) A very good bee plant[7, 13, 20, 201]. This species is notably resistant to honey fungus[88, 200]. Special Features: North American native, Invasive, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Fragrant flowers, Blooms are very showy. The plant is heat tolerant in zones 9 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.1.13 Lespedeza bicolor

Lespedeza, Shrub lespedeza

tfo2n 4 tlin 8 cyuc 3 kcaak 4 tcan 0 dwat 3 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lespedeza bicolor is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil Seed StemEdible Uses: Oil TeaYoung leaves and stems - cooked[105, 177, 179, 183]. Flowers - cooked[177, 183]. Seed - cooked[105, 177, 179]. Occasionally boiled and eaten with rice[183]. The leaves are used as a tea substitute[177, 183, 266].

tcanta Basketry Fodder Oil Shelterbelt Soil stabilization-The seed oil is used as a lubricant[266]. The branchlets are used for making baskets[266]. Because this species tolerates arid soils, it is grown as a windbreak, and for sand stabilization, and soil conservation[266].

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are

large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Agroforestry Services: Nitrogen Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Fodder Minor Global CropEasily grown in a well-drained light loam in full sun[1, 182]. Succeeds in light shade and in dry soils[266]. The top growth is not very cold tolerant, although the rootstock is hardy to about -25°C. Plants are usually cut back to the ground in all but very mild winters, though they generally resprout well from the base in the following spring and flower in late summer[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 5.1.14 Vicia sativa

Winter Tares, Garden vetch, Subterranean vetch

tfo2n 4 tlin 8 cyuc 3 kcaak 3 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tucp hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyfxre7t hjonli

drutta Vicia sativa is a ANNUAL CLIMBER growing to 1.2 m (4ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: TeaSeed - cooked[22, 74]. Not very palatable nor very digestible but it is very nutritious[2, 115]. The seed can be dried, ground into a powder and mixed with cereal flour to make bread, biscuits, cakes etc[183]. The beans compliment the protein in the cereal making it more complete[K]. Some caution is advised, see the notes above on toxicity. Leaves, young shoots and young pods - cooked[105, 177, 183]. The leaves are a tea substitute[183].

tcanta Green manureA very valuable green manure crop, it can be sown in spring or as late as October. A deep rooted and fast growing plant, it is winter hardy, an effective weed suppresser, produces a good bulk and fixes a large amount of nitrogen[87]. Dynamic accumulator.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and sow in situ from late winter to early summer and again in the autumn.

nwatta Succeeds in any well-drained soil in a sunny position if the soil is reliably moist throughout the growing season, otherwise it is best grown in semi-shade[200]. The subspecies V. sativa leucosperma. Ser. is the form usually grown for food[74]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other

238]. It is taken internally in the treatment of diarrhoea, fevers, vomiting, coughs with thick dark phlegm, lung abscesses, urinary tract infections and food poisoning (especially from sea foods)[238, 257]. Externally, it is mixed with gypsum and used to treat halitosis and toothache[238]. The root is harvested in the autumn and juiced or dried for use in decoctions[238].

propta Seed - surface sow in spring in a light position. Keep the soil moist by emmersing the pot in 3cm of water. Germination usually takes place quite quickly. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in spring. Very simple, any part of the root that has a growth bud will grow into a new plant. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Fodder: Bank Industrial Crop: Biomass Minor Global CropA very easily grown plant that thrives in deep moisture retentive soils such as marshes and swamps, whilst it also grows well along the sides of streams, lakes and ponds, in shallow water, ditches and wet wastelands[162, 200, 269]. Plants are tolerant of moderately saline water[169, 269]. The plant is reported to tolerate an annual precipitation in the range of 31 to 241cm, an annual temperature in the range of 6.6 to 26.6°C and a pH of 4.8 to 8.2[269]. Plants are hardy to about -20°C[200]. This species is very fast growing with a very vigorous and invasive running rootstock that can be 10 metres or more long, it can form very large stands in wetlands[200, 238, 260]. Difficult to eradicate once established, it is unsuitable for planting into small spaces[200, 238, 269]. The flowering heads are often used in dried flower arrangements[238]. There are some named forms, selected for their ornamental value[238].

### 5.2.16 Amelanchier confusa

4 tlin 8 cyuc 5 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tucp hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier confusa is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: We have no records for this species, but the fruit is almost certainly edible both raw and cooked[K]. It is 7 - 9mm in diameter[200]. The fruit is rich in iron and copper[226].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Prefers an acid or neutral soil. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some

species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. A suckering plant, the suckers are formed very close to the original stem so the plant forms a gradually expanding clump[K]. Plants growing at Hilliers Arboretum in Hampshire were 4 metres tall in early April 1999, they were suckering quite freely in a tight clump and flowering very freely[K]. This species is closely related to *A. laevis*[11]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 5.2.17 Chenopodium spp.

Perennial quinoa

4 tlin 10 cyuc 5 kcaak 2 tcan 3 dwat 2 m hkuc htut cyutli hgtakytucup hwicli hysrasjlutnyik hpa7tli frusflatprikwiissliphsom hpa7tmwatli hjonli

drutta Chenopodium spp. is a PERENNIAL growing to 2 m (6ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid, very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: Edible portion: Leaves, Seeds, Vegetable. Seed - cooked[ 1 , 2 , 4 , 27 , 57 , 97 ]. A pleasant mild flavour, the seed can absorb the flavour of other foods that are cooked with it and so it can be used in a wide variety of ways[ K ]. The protein is good quality because of its amino acid balance. It has 2-6% more protein and better amino acid balance than wheat. It should be thoroughly soaked and rinsed to remove a coating of saponins on the seed surface. The seed can be used in all the ways that rice is used, as a savoury or sweet dish. It can also be ground into a powder and used as a porridge[ 37 , 183 ]. The seed can also be sprouted and used in salads[ 183 ] though many people find the sprouted seed unpleasant[ K ]. The seed contains a very high quality protein that is rich in the amino acids lysine, methionine and cystine, it has the same biological value as milk[ 196 ]. The seed contains about 38% carbohydrate, 19% protein, 5% fat, 5% sugar[ 171 ]. Leaves - raw or cooked[ 2 , 4 , 37 , 57 ]. The young leaves are cooked like spinach[ 183 ]. It is best not to eat large quantities of the raw leaves, see the notes above on toxicity.

tcanta Gold/green dyes can be obtained from the whole plant[ 168 ]. Saponins on the seed can be used as a bird and insect deterrent by spraying them on growing plants[ 141 ]. The saponins are obtained by saving the soak-water used when preparing the seed for eating. The spray remains effective for a few weeks or until washed off by rain[ K ].

dwatta Some medical properties. See individual plants for example: Chenopodium album, Chenopodium ambrosioides, Chenopodium ambrosioides anthelminticum

propta Seed - sow April in situ. The seed can either be sown broadcast or in rows about 25cm apart, thinning the plants to about every 10cm. Germination is rapid, even in fairly dry conditions. Be careful not to weed out the seedlings because they look very similar to some common garden weeds[ K ].

nwatta Hypothetical Crop Management: StandardClimate: cold temperate to subtropical, tropical highlands. Humidity: humid. A cultivated food crop. A plant of higher elevations in the tropics, it has also been successfully grown in the temperate and subtropical zones. Plants tolerate light frosts at any stage in their development except when flowering[ 57 , 196 ]. An easily grown plant, it requires a rich moist well-drained soil and a warm position if it is to do really well, but it also succeeds in less than optimum conditions[ 27 , 37 ]. Tolerates a pH range from 6 to 8.5 and moderate soil salinity[ 196 ]. Plants are quite wind resistant[ K ]. Plants are drought tolerant once they are established[ 196 ]. The plant is day-length sensitive and many varieties fail to flower properly away from equatorial regions, however those varieties coming from the south of its range in Chile are more likely

are large enough to handle and grow on in a greenhouse for their first year. Plant out in late spring as the plant comes into new growth. Basal stem cuttings in the summer[37]. Division in the dormant season, never when in growth[1]. The plant will often produce a number of shoots, the top 5 - 10 cm of the root below each shoot can be potted up to form a new plant whilst the lower part of the root can be eaten[K]. Tubercles (baby tubers) are formed in the leaf axils. These are harvested in late summer and early autumn when about the size of a pea and coming away easily from the plant. They should be potted up immediately in individual pots in an unheated greenhouse or cold frame, covering them with about 10mm of soil. Protect them from mice etc and keep the soil moist but not wet. They should come into growth in the spring, plant them out in early summer when in active growth[K].

**nwatta** Management: Standard Minor Global Crop Staple Crop: Basic StarchAn easily grown plant, succeeding in a fertile well-drained soil in a sunny position or light shade[27, 37, 200], though it is best in full sun[160]. Plants are hardy to at least -18°C[160]. This species of yam is much cultivated in China for its edible root which can be up to 1 metre long[1]. It has a great potential to be a commercial crop in Britain, though a satisfactory method of harvesting the root needs to be found[K]. Plants take 3 - 4 years to reach full maturity[160], though one year roots of well grown plants can weigh more than 500g. There are many cultivated forms with different root shapes in China and Japan[174]. The yam is a climbing plant that supports itself by twining around the branches of other plants[219]. It can be grown successfully into small bushes or, perhaps simpler when being grown as a root crop, it can be grown up a frame in a similar manner to growing runner beans[K]. Plants produce tubercles (small tubers that are formed in the leaf axils of the stems), and can be propagated by these means[K]. The small white flowers have a pleasant scent of cinnamon[219]. There is some confusion over the correct name for this species. One report says that *D. batatas* is an invalid name that is often erroneously applied to two distinct species *D. opposita* and *D. japonica*[218]. The Flora of China accepts *D. batatas* as a synonym for *D. polystachya*[266]. Dioecious. Male and female plants must be grown if seed is required. Carbon Farming - Cultivation: regional crop. Management: standard. The plant is heat tolerant in zones 10 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.15 Phragmites australis

Common Reed, American common reed, Hybrid common reed, European common reed, Subtropical common re 4 tin 10 cyuc 5 kcaak 4 tcan 2 dwat 3.6 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjnutnyik hpa7tli flatprikwlwissiphsmo hpa7tmwatli xre7t hjonli

drutta Phragmites australis is a PERENNIAL growing to 3.6 m (11ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water. The plant can tolerate maritime exposure.

**kcakta** Edible Parts: Leaves Root Seed Shoots StemEdible Uses: Condiment Drink SweetenerRoot - raw or cooked

like potatoes[2, 13, 74, 102, 106, 183]. It contains up to 5% sugar. The flavour and texture are best when the root is young and still growing[144]. It can be dried, ground coarsely and used as a porridge[12, 46, 62]. In Russia they are harvested and processed into starch[269]. Young shoots - raw or cooked[61, 62, 102, 179]. They are best if used before the leaves form, when they are really delicious[144]. They can be used like bamboo shoots[183]. The partly unfolded leaves can be used as a potherb and the Japanese dry young leaves, grind them into a powder and mix them with cereal flour when making dumplings[183]. The stems are reported to contain 4.8 g protein, 0.8 g fat, 90.0 g total carbohydrate, 41.2 g fiber, and 4.4 g ash[269]. Seed - raw or cooked[257]. It can be ground into a powder and used as a flour[57, 62, 102, 106]. The seed is rather small and difficult to remove from the husk but it is said to be very nutritious[183]. A sugar is extracted from the stalks or wounded stems[2, 5, 62, 95]. A sweet liquorice-like taste[95], it can be eaten raw or cooked[62]. The stems can be boiled in water and then the water boiled off in order to obtain the sugar[178]. A sugary gum that exudes from the stems can be rolled into balls and eaten as sweets[183]. A powder extracted from the dried stems can be moistened and roasted like marshmallow[62, 95, 102, 183].

tcanta Alcohol Basketry Biomass Broom Cork Dye Fencing Fertilizer Fibre Fodder Fuel Furniture Green manure Insulation Miscellany Paper Pencil Soil stabilization String Teeth Thatching WeavingThe common reed can provide a large quantity of biomass and this is used in a wide variety of ways as listed below. Annual yields of 40 - 63 tonnes per hectare have been reported[269]. The plant is also converted into alcohol (for use as a fuel), is burnt as a fuel and is made into fertilizer[238]. The plant is rich in pentosans and may be used for the production of furfural - the nodes and sheaths yield 6.6% whilst the underground parts over 13% of furfural[269]. The pentosan content increases throughout the growing period and is maximum in the mature reed[269]. The reed can be used also for the preparation of absolute alcohol, feed yeast and lactic acid[269]. The stems are useful in the production of homogeneous boards[269]. They can also be processed into a fine fibrous material suitable as a filler in upholstery[269]. The stems have many uses. They are used for thatching roofs[1, 46, 74, 106]. It can last for 100 years[169]. The stems and leaves are also used for building dwellings, lattices, fences, arrows by Indians, and for weaving mats, carrying nets, basket making, insulation, fuel, as a cork substitute etc[13, 74, 99, 102, 115, 257, 269]. The stem contains over 50 percent cellulose and is useful in the manufacture of pulps for rayon and paper[269]. The fibre from the leaves and stems is used for making paper[189]. The fibre is 0.8 - 3.0 mm long and 5.0 - 30.5µm in diameter. The stems and leaves are harvested in the summer, cut into usable pieces and soaked for 24 hours in clear water. They are then cooked for 2 hours with lye and beaten in a blender. The fibre makes a khaki paper[189]. A fibre obtained from the plant is used for making string[95, 106]. The flowering stalks yield a fibre suitable for rope making[269]. The leaves are used in basket making and for weaving mats etc[169, 238]. A light green dye is obtained from the flowers[6, 115]. Freshly cut shoots are a good green manure[74] (Does this man as a soil mulch?[K]). The inflorescences are used as brooms[74]. The plant can be used as a cork substitute[74]. No further details. The plant is mixed with mud to make a plaster for walls[145]. Pens for writing on parchment were cut and fashioned from the thin stems of this reed[269], whilst the stems were also used as a linear measuring device[269]. The plant has a very vigorous and running rootstock, it is useful for binding the soil along the sides of streams etc[115]. It is planted for flood control since it stabilizes the banks and gradually builds up soil depth, thus raising the level of the bank.

dwatta Antiasthmatic Antidiarrhoeal Antidote Antiemetic Antipyretic Antitussive Cholera Depurative Diuretic Febrifuge Fibrifuge Lithotropic Miscellany Odontalgic Refrigerant Sedative Sialogogue Skin Stomachic Stypitic UrinaryThe leaves are used in the treatment of bronchitis and cholera, the ash of the leaves is applied to foul sores[218]. A decoction of the flowers is used in the treatment of cholera and food poisoning[218]. The ashes are stypitic[218]. The stem is antidote, antiemetic, antipyretic and refrigerant[218]. The root is antiasthmatic, antiemetic, antipyretic, antitussive, depurative, diuretic, febrifuge, lithotropic, sedative, sialogogue and stomachic[147, 176, 218,

plants growing nearby[200].

## 5.1.15 Comptonia peregrina asplenifolia

Sweet Fern tfo2n 4 tin 8 cyuc 3 kcaak 3 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyhshrasjlut hpa7tli frusflat hpa7tmwatli hjonli

drutta Comptonia peregrina asplenifolia is a deciduous Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

**kcakta** Edible Parts: FruitEdible Uses: Condiment TeaThe young fruits are eaten as a pleasant nibble[55, 62, 183]. The aromatic leaves, fresh or dried, are used to make a palatable tea[55, 62, 102, 183]. The leaves are also used as a seasoning[183].

tcanta Incense Lining Parasiticide RepellentThe leaves are used as a lining in baskets etc in order to preserve the fruit[55]. The crushed leaves repel insects[102]. They can be thrown onto a camp fire to keep mosquitoes away[257]. The dried leaves have been burnt as an incense[257].

dwatta Astringent Blood purifier Expectorant Febrifuge Odontalgic Parasiticide Poultice TonicSweet fern was employed medicinally by several native North American Indian tribes who used it especially as a poultice to treat a variety of complaints[257]. It is still used for most of the same purposes in modern herbalism. The leaves are astringent, blood purifier, expectorant and tonic[21, 62, 222, 257]. A tea made from the leaves and flowering tops is used as a remedy for diarrhoea, headache, fevers, catarrh, vomiting of blood, rheumatism etc[213, 222, 257]. The infusion has also been used to treat ringworm[257]. The leaves have also been used as a poultice for toothaches, sprains etc[238, 257]. A cold water infusion of the leaves has been used externally to counter the effect of poison ivy[213, 222, 257] and to bathe stings, minor haemorrhages etc[238]. The leaves are harvested in early summer and dried for later use[238].

propta Seed - it has a very tough seed coat and also contains germination inhibitors and so is very difficult to germinate[113]. It is probably best to harvest the seed 'green' (after the seed has fully developed but before it dries on the plant) and sow immediately in a cold frame. If the seed has been stored then soaking in hot water for 24 hours will leach out some of the inhibitors and also help to soften the seed coat. Scarification will also help as will a period of cold stratification. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out into their permanent positions in late spring or early summer[K]. Root cuttings, 4cm long December in a frame[78, 113]. Plant the root horizontally. High percentage[78]. Suckers removed in the dormant season and potted up or planted into their permanent positions[200]. Plants can be difficult to move successfully[238]. Layering in spring[238].

nwatta Requires a peaty or light loam lime-free soil[11, 182, 200]. Requires an acid well-drained soil of low to medium fertility in partial shade but tolerates full sun if the soil does not dry out in the summer[200]. Tolerates dry sandy soils when grown in the shade[200]. A very ornamental plant[1], it is hardy to at least -25°C[184, 200]. This form is probably no more than a phenotypic variant of the species that is found growing in harsh conditions[200]. The crushed leaves are very aromatic[182], their scent is most noticeable in the early morning and the evening[238]. The scent increases when the leaves are dried[245]. This species is somewhat intolerant of root disturbance and should be planted out into its permanent position whilst small[238]. Suckering freely[184], this plant is well suited to clothing banks on soils of low fertility[200]. It has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots

of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.16 Vicia sativa leucosperma

Winter Tares tfo2n 4 tin 8 cyuc 3 kcaak 3 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikwlwis hpa7tmwatli fyifxre7t hjonli

drutta Vicia sativa leucosperma is a ANNUAL CLIMBER growing to 1.2 m (4ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Leaves SeedEdible Uses: TeaSeed - cooked[22, 74]. Not very palatable nor very digestible but it is very nutritious[2, 115]. The seed can be dried, ground into a powder and mixed with cereal flour to make bread, biscuits, cakes etc[183]. The beans compliment the protein in the cereal making it more complete[K]. Some caution is advised, see the notes above on toxicity. Leaves, young shoots and young pods - cooked[105, 177, 183]. The leaves are a tea substitute[183].

tcanta Green manureA very valuable green manure crop, it can be sown in spring or as late as October. A deep rooted and fast growing plant, it is winter hardy, an effective weed suppresser, produces a good bulk and fixes a large amount of nitrogen[87].

dwatta None known propta Pre-soak the seed for 24 hours in warm water and sow in situ from late winter to early summer and again in the autumn.

nwatta Succeeds in any well-drained soil in a sunny position if the soil is reliably moist throughout the growing season, otherwise it is best grown in semi-shade[200]. This subspecies is the form usually grown for food[74]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.17 Ceanothus americanus

New Jersey Tea, Wild Snowball tfo2n 4 tin 9 cyuc 3 kcaak 3 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli kyuctcup hwicli hyhshrasjlut hpa7tli flatprikwlwis hpa7tmwatli xre7t hjonli

drutta Ceanothus americanus is a deciduous Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta** Edible Parts: Edible Uses: TeaA refreshing and stimulating tea is made from the dried leaves, it is a good substitute for china tea though it does not contain caffeine[2, 21, 43, 46, 95, 159, 161, 183]. The leaves are gathered when the plant is in full bloom and are dried in the shade[183].

tcanta Dye SoapA green dye is obtained from the flowers[168]. A cinnamon-coloured dye is obtained from the whole plant[4]. A red dye is obtained from the root[95, 159]. The flowers are rich in saponins, when crushed and mixed with water they produce an excellent lather which is an effective and gentle soap[168, 169]. They can be used as a body wash (simply rub the wet blossoms over the body) or to clean clothes[K]. The flowers were much used by the North American Indians as a body wash, especially by the women

in preparation for marriage, and they leave the skin smelling fragrantly of the flowers[K].

dwatta Antispasmodic Astringent Dysentery Expecto- rant Haemostatic Hypotensive Sedative VDThe roots and root bark of New Jersey tea was used extensively by the North American Indians to treat fevers and problems of the mucous membranes such as catarrh and sore throats[254]. Current day usage of the roots concentrates on their astringent, expectorant and antispasmodic actions and they are employed in the treatment of complaints such as asthma, bronchitis and coughs[254]. The roots and root-bark are antispasmodic, antispasmodic, strongly astringent (they contain 8% tannin), expectorant, haemostatic and sedative[21, 222]. They have a stimulatory effect on the lymphatic system[238], whilst an alkaloid in the roots is mildly hypoten- sive[222]. The plant is used internally in the treatment of bronchial complaints including asthma and whooping cough, dysentery, sore throats, tonsillitis, haemorrhoids etc[4, 222, 238]. A decoction of the bark is used as a skin wash for cancer and venereal sores[213]. The powdered bark has been used to dust the sores[213]. The roots are unearthed and partially harvested in the autumn or spring when their red colour is at its deepest. They are dried for later use[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place in 1 - 2 months at 20°C[138]. One report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Landscape Uses:Border, Erosion control, Ground cover, Hedge, Massing, Rock garden. Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. Another report says that it dislikes alkaline soils, though succeeds in poor dry conditions[238]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Any pruning is best carried out in the spring[219]. Fast growing, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212]. Special Features:North American native, Naturalizing, Attracts butterflies, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (120 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.1.18 Vicia faba equina

Horsebean

tfo2n 4 tlin 8 cyuc 3 kcaak 3 tcan 0 dwat 1 m hkuc hmimhntu cyutli tcup hwicli hrasljutnykrip hpa7tli flatprik- wis hpa7tmwatli fyfjxre7t hjonli

drutta Vicia faba equina is a ANNUAL growing to 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kckahta Edible Parts: Leaves SeedEdible Uses: Seed - raw or cooked[27, 61]. It can be eaten before it is fully ripe in the same way as broad beans, the fully ripe seed requires overnight soaking to soften it before it is cooked. Leaves - cooked[105]. Used like spinach.

tcanta Fibre Green manure Soap makingA good green manure crop, sown in autumn or spring. Relatively fast growing, producing a good bulk and fixing nitrogen[87]. The upright growth is not a very good weed suppresser though. A fibre is obtained from the stems. The burnt stems are rich in potassium and can be used in making soap.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta Prefers a fairly heavy loam but succeeds in a sunny position in most soils that are well-drained[1]. Grows well in heavy clay soils. Dislikes dry conditions[57]. Sometimes cultivated for its edible seed, more commonly as a green manure crop[87]. There are 2 main types, 'daffa' beans are the more hardy and can be sown in the autumn, whilst 'tic' beans are best sown in spring. The autumn sown varieties are more susceptible to 'chocolate spot' fungus (which can be remedied by the addition of potash to the soil) but are more likely to escape damage from aphids[87]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

## 5.1.19 Lupinus perennis

Sundial Lupine

tfo2n 4 tlin 8 cyuc 3 kcaak 3 tcan 1 dwat 0.6 m hkuc htut cyutli kyuctup hwicli hyishrasljut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lupinus perennis is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kckahta Edible Parts: Seed SeedpodEdible Uses: Seed - cooked[105]. Used as a protein-rich vegetable or savoury dish in any of the ways that cooked beans are used, they can also be roasted or ground into a powder. The seed has a bitter flavour due to the presence of toxic alkaloids, it should be thoroughly leached before being cooked[2, 105]. Seedpods - cooked[105].

tcanta Nitrogen fixer. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiemetic HaemostaticA cold tea made from the leaves has been used to treat nausea and internal haemorrhages[222, 257].

permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Plants are fairly lime tolerant[200], they also grow well in heavy clay soils. Hardy to about -20°C according to one report[184], whilst another suggests that this species is hardy to about -50°C[11]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. This species is particularly interesting because it is quite compact and produces an excellent quality quite large fruit[K]. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. A very variable species, ranging from a thicket-forming shrub to a small tree in the wild[229]. It is occasionally cultivated for its edible fruit, there are several named varieties[183]. A stoloniferous species, spreading by suckers to form a thicket[11]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:North American native, Blooms are very showy. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (120 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.13 Rubus phoenicolasius

Japanese Wineberry, Wine raspberry

4 tlin 8 cyuc 5 kcaak 1 tcan 0 dwat 3 m hkuc hmimhntu cyutli tcup hwicli hrasljutnyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Rubus phoenicolasius is a deciduous Shrub growing to 3 m (9ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by In- sects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 2, 3, 34]. Sweet and juicy[11]. A raspberry-type fruit, it is smaller than a raspberry, contains rather a lot of seeds and is not quite such a flavourful fruit, but it makes very nice eating all the same[K]. After flowering, the fruit is enclosed in its calyx until just before it is ripe, this prevents maggots etc getting into the fruit[K]. The fruit is about 20mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification, is best sown in early autumn in a cold frame. Sow stored seed as early as possible in the year in a cold frame and stratify for a month at 3°C if sowing later than February. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Tip layering in July. Plant out in autumn. Division in early spring.

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200], preferring light shade[202]. Plants are not too happy when grown in windy situations[K]. Hardy to about -18°C[202]. Some damage may be caused at this temperature but plants usually recover well[202]. A very ornamental plant, its red stems adding colour to the winter garden[1], it is sometimes cultivated for its edible fruit[1, 61]. There is at least one named variety, 'Bella di Tokyo' has small tasty red fruits[183]. This species is a raspberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 5.2.14 Dioscorea batatas

Chinese Yam

4 tlin 11 cyuc 5 kcaak 3 tcan 5 dwat 3 m hkuc hmimhntu cyutli tcup hwicli hrasljutnyk hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Dioscorea batatas is a PERENNIAL growing to 3 m (9ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Fruit RootEdible Uses: Tuber - cooked[1, 46, 61, 105]. A floury texture[27] with a very pleasant flavour that is rather like a potato[K]. The tubers can be boiled, baked, fried, mashed, grated and added to soups[183]. They store well and for a long time[27, 37] and can also be left in the ground and harvested as required in the winter[K]. This is a top quality root crop, very suitable for use as a staple food[K]. An arrowroot can be extracted from the root[46], though this is not as good at binding other foods as the starch from *D. japonica*[183]. The root contains about 20% starch. 75% water, 0.1% vitamin B1, 10 - 15 mg% vitamin C[174]. Fruit. A starchy flavour, it is said to be very good for the health[206]. We wonder if this report is referring to the tubercles[K]. We've heard the aerial tubers can be eaten and are very tasty. Carbon Farming - Staple Crop: basic starch.

tcanta MiscellanyNone known

dwatta Anthelmintic Antidote Contraceptive Digestive Miscellany Vitamin CThe Chinese yam, called Shan Yao in Chinese herbalism, is a sweet soothing herb that stimulates the stomach and spleen and has a tonic effect on the lungs and kidneys[238]. The tuber contains allantoin, a cell-proliferant that speeds the healing process[238]. The root is an ingredient of "The herb of eight ingredients", traditionally prescribed in Chinese herbalism to treat hyperthyroidism, nephritis and diabetes[254]. The tuber is anthelmintic, digestive and gently tonic[116, 147, 218, 254]. It is used internally in the treatment of tiredness, weight loss, poor appetite, poor digestion, chronic diarrhoea, asthma, dry coughs, frequent or uncontrollable urination, diabetes and emotional instability[238]. It is applied externally to ulcers, boils and abscesses[218, 238]. The tubers are harvested in the autumn and can be used raw or baked[238]. The leaf juice is used to treat snakebites and scorpion stings[218]. The roots of most, if not all, members of this genus, contains diosgenin[222, 240]. This is widely used in modern medicine in order to manufacture progesterone and other steroid drugs. These are used as contraceptives and in the treatment of various disorders of the genitary organs as well as in a host of other diseases such as asthma and arthritis[222].

propta Seed - sow March to April in a sunny position in a warm greenhouse and only just cover. It germinates in 1 - 3 weeks at 20°C[175]. Prick out the seedlings as soon as they

map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.11 Pyrus communis sativa

Pear  
4 tin 8 cyuc 5 kcaak 3 tcan 0 dwat 5 m hkuc  
hmmihtut cyulit hgattcup hwicli hrasjlutnykfrip hpa7tli flatprklwis hpa7tmwatli dyatxre7t hjonli

drutta Pyrus communis sativa is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA Hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The flavour ranges from rather harsh and astringent (cultivars used for making alcoholic drinks) through to soft, sweet and very juicy. The best dessert fruits have an exquisite sweet flavour, usually with a very soft flesh, whilst cooking varieties have harder less sweet flesh[K].

tcanta Dye WoodA yellow-tan dye is obtained from the leaves[106, 115]. Wood - heavy, tough, durable, fine grained, hard. Used by cabinet and instrument makers[11, 61, 100, 149]. When covered with black varnish it is an excellent ebony substitute[74].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year. The seed of pear cultivars will not usually breed true to type.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils[200]. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile, though plants can become chlorotic on very alkaline soils[200]. Established plants are drought tolerant[200]. Very hardy, tolerating temperatures down to below -15°C[200]. Widely cultivated for its edible fruit in temperate areas, there are many named varieties that can provide fruit from late July to April or May of the following year. This is the collective name for all the pear cultivars that have been derived from *P. communis*, probably through hybridization with *P. cordata* and *P. nivalis*. Where space is at a premium, or at the limits of their climatic range, pears can be grown against a wall. Most cultivars will grow well against a sunny south or west facing wall but, because of their relatively early flowering, they are not really suitable for north or east facing walls[219]. Most cultivars are not self-fertile and a number of cultivars have incompatible pollen, so care must be taken to ensure the provision of a suitable pollen partner[200]. Trees grow less well in grass, root secretions from the grass inhibiting the root growth of the pear[201]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern

is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.12 Amelanchier alnifolia

Saskatoon, Saskatoon serviceberry, Serviceberry  
4 tin 6 cyuc 5 kcaak 3 tcan 2 dwat 4 m hkuc  
hmmihtut cyulit tcup hwicli hrasjlutnykfrip hpa7tli flatprklwis hpa7tmwatli fyfkrxre7t hjonli

drutta Amelanchier alnifolia is a deciduous Shrub growing to 4 m (13ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower in May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaEdible fruit - raw or cooked[3, 11, 46, 62, 101]. The fruit ripens in mid summer (early July in southern Britain) it is soft and juicy with a few small seeds in the centre. A very nice sweet flavour that is enjoyed by almost everyone who tries it, there is a hint of apple in the taste[K]. About the size of a black-currant, the fruit is produced in small clusters and the best wild forms can be 15mm in diameter[200, 212]. The fruit can also be dried and used as raisins or made into pemmican[101, 183]. The fruit is rich in iron and copper[226]. The leaves are a tea substitute[161, 257].

tcanta Shelterbelt Soil stabilizationPlants have a spreading, suckering root system and are used in windbreaks for erosion control[200]. Young branches can be twisted to make a rope[257]. Wood - hard, straight grained, tough. Used for tool handles etc. The wood can be made even harder by heating it over a fire and it is easily moulded whilst still hot[99]. The young stems are used to make rims, handles and as a stiffening in basket making[257]. Landscape Uses: Erosion control, Massing, Woodland garden. Hedging and Screens, Architectural City and Courtyard Gardens Cottage and Informal Garden, Wildlife Gardens (RHS).

dwatta Appetizer Birthing aid Contraceptive Diaphoretic Febrifuge Laxative Ophthalmic StomachicSaskatoon was quite widely employed as a medicinal herb by the North American Indians, who used it to treat a wide range of minor complaints[257]. It is little used in modern herbalism. An infusion of the inner bark is used as a treatment for snow-blindness[172]. A decoction of the fruit juice is mildly laxative. It has been used in the treatment of upset stomachs, to restore the appetite in children, it is also applied externally as ear and eye drops[257]. A decoction of the roots has been used in the treatment of colds[257]. It has also been used as a treatment for too frequent menstruation[257]. A decoction of the stems, combined with the stems of snow-berry (*Symphoricarpos* spp) is diaphoretic. It has been used to induce sweating in the treatment of fevers, flu etc and also in the treatment of chest pains and lung infections[257]. A decoction of the plant, together with bitter cherry (*Prunus emarginata*) has been used as a contraceptive[257]. Other recipes involving this plant have also been used as contraceptives including a decoction of the ashes of the plant combined with the ashes of pine branches or buds[257]. A strong decoction of the bark was taken immediately after childbirth to hasten the dropping of the placenta. It was said to help clean out and help heal the woman’s insides and also to stop her menstrual periods after the birth, thus acting as a form of birth control[257].

propta Seed - it is best harvested ‘green’, when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a greenhouse. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. It should also be possible to sow the seed outdoors in situ in the middle of spring. It might be necessary to protect this sowing from mice. Division in early March[1]. Difficult. Basal cuttings in April[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, succeeding in any moderately good soil in a sunny position[200]. Grows well in a poor sandy soil[187]. Requires an acid to neutral soil[200]. Plants are hardy to about -25°C[187]. This species is very susceptible to slug damage. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.1.20 Vicia faba minuta

Tick Bean

hf02n 4 tin 8 cyuc 3 kcaak 3 tcan 0 dwat m hkuc  
hmmihtut cyulit tcup hwicli hrasjlutnykfrip hpa7tli flatprklwis hpa7tmwatli fyfkrxre7t hjonli

drutta Vicia faba minuta is a ANNUAL growing to 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[27, 61]. It can be eaten before it is fully ripe in the same way as broad beans, the fully ripe seed requires overnight soaking to soften it before it is cooked. Leaves - cooked[105]. Used like spinach.

tcanta Fibre Green manure Soap makingA good green manure crop, it is best sown in the spring. Relatively fast growing, producing a good bulk and fixing nitrogen[87]. The upright growth is not a very good weed suppresser though. A fibre is obtained from the stems. The burnt stems are rich in potassium and can be used in making soap.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta Prefers a fairly heavy loam but succeeds in a sunny position in most soils that are well-drained[1]. Grows well in heavy clay soils. Dislikes dry conditions[57]. Sometimes cultivated for its edible seed, though more commonly as a green manure crop[87]. Tick beans are not as winter-hardy as other forms of this species and so are best sown in the spring. The autumn sown varieties are more susceptible to ‘chocolate spot’ fungus (which can be remedied by the addition of potash to the soil) but are more likely to escape damage from aphids[87]. This species has a symbiotic

relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

## 5.1.21 Trifolium repens

White Clover, Dutch Clover, Purple Dutch Clover, Shamrock, White Clover

ht02n 4 tin 8 cyuc 3 kcaak 4 tcan 2 dwat 0.1 m hkuc  
htut cyulit tcup hwicli hyhisrasjlutnykfrip hpa7tli flatprklwisslip hpa7tmwatli xre7t hjonli

drutta Trifolium repens is an evergreen Perennial growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Condiment TeaLeaves - raw or cooked as a potherb[13, 94, 183]. The young leaves are harvested before the plant comes into flower and are used in salads, soups etc[9]. They can also be used as a vegetable, cooked like spinach[9]. The leaves are best cooked[172]. Flowers and seed pods are dried, ground into powder and used as a flour or sprinkled on cooked foods such as boiled rice[183]. Very wholesome and nutritious[115]. The young flowers can also be used in salads[144, 172, 183]. Root - cooked[172, 177]. The dried leaves impart a vanilla flavour to cakes etc[172]. Dried flowering heads are a tea substitute.

tcanta Fodder Green manureThe plant makes a good green manure, it is useful for over-wintering, especially in a mixture with *Lolium perenne*[87]. Produces a good bulk. It is a host to ‘clover rot’ however, so should not be used too frequently[87]. It can be undersown with cereals or with tomatoes in a greenhouse (sow the seed before planting the tomatoes)[87]. Fairly deep rooting but not very fast growing[87]. A good fast ground-cover plant for a sunny position[87]. Nectary. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antirheumatic Antiscrophulatic Depurative Detergent Ophthalmic TonicThe plant is antirheumatic, antiscrophulatic, depurative, detergent and tonic[218]. An infusion has been used in the treatment of coughs, colds, fevers and leucorrhoea[257]. A tincture of the leaves is applied as an ointment to gout[218]. An infusion of the flowers has been used as an eyewash[257].

propta Pre-soak the seed for 12 hours in warm water and then sow in spring in situ. If the seed is in short supply it might be better to sow it in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. Division in spring[238].

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Understory legume Fodder: Pasture Global Crop Management: Fodder Management: Hay Staple Crop: ProteinLandscape Uses: Ground cover. Succeeds in a moist, well-drained circum-neutral soil in full sun, preferring a sweet calcareous clay soil. Succeeds in poor soils. A very important food plant for the caterpillars of many butterfly and moth species[30] it is also a good bee plant[54]. A good companion plant in the lawn, tolerating trampling[18, 54], but it dislikes growing with henbane or members of the buttercup family[18]. It grows well in an apple orchard, the trees will produce tastier fruit that stores better[201]. It should not be grown with camellias or gooseberries because it harbours a mite that can cause fruit drop in the gooseberries and premature budding in the camellias[201]. Polymorphic, there are many subspecies and varieties. Some varieties have also been selected for use in lawn mixes[183]. This species has a symbiotic relationship with certain soil

bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Buttercups growing nearby depress the growth of the nitrogen bacteria by means of a root exudate[201]. Special Features:Not North American native, Invasive. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zones. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.1.22 Hedysarum hedysaroides

Alpine French Honeysuckle

tfo2n 4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.4 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hedysarum hedysaroides is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked. Sweet and highly nutritious. Harvested from late autumn to spring, it is sweetened by frost[172].

tcanta None known  
dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil that is moist in summer[187] and a sunny position[1], preferring a deep well-drained sandy loam[1, 200]. This species is hardy to about -20°C[187]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.23 Lupinus nootkatensis

Blue Lupine, Nootka lupine

tfo2n 4 tlin 8 cyuc 3 kcaak 3 tcan 0 dwat 0.7 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lupinus nootkatensis is a PERENNIAL growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Root Seed SeedpodEdible Uses: Seed - cooked[105]. Used as a protein-rich vegetable or savoury dish in any of the ways that cooked beans are used, they can also be roasted or ground into a powder. If the seed is bitter this is due to the presence of toxic alkaloids and the seed should be thoroughly leached before being cooked[2,

105]. Root - raw or cooked[256, 257]. Peeled and then eaten raw or boiled[257]. The roots are harvested in the spring and are then roasted before being eaten[256]. The roasted root can be dried, ground into a flour and then stored for later use. The raw root should not be eaten since they contain toxic alkaloids and will cause a drunken-like state if eaten in excess, but the cooked root is safe to eat[256, 257]. Seed-pods - cooked[105].

tcanta Ornamental. Nitrogen fixer. Dynamic accumulator.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a greenhouse. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. It should also be possible to sow the seed outdoors in situ in the middle of spring. It might be necessary to protect this sowing from mice. Division in early March[1]. Difficult. Basal cuttings in April[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, succeeding in any moderately good soil in a sunny position[200]. This species is very susceptible to slug damage, the plant has been cultivated as an ornamental, but has virtually died out in the garden though it grows well in the wild in Scotland[187]. Closely related to *L. perennis*[200] and possibly no more than a subspecies of it[50], the uses listed below are for *L. perennis* but it is assumed that they also apply to this species[K]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.24 Hedysarum alpinum

Alpine Sweetvetch

tfo2n 4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hedysarum alpinum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[61, 177]. A carrot-like flavour[105]. The root can be harvested from autumn until spring, it tastes best after some frosts[172]. Possibly toxic. \*\* Please read The New Yorker link in the Reader Comments below

tcanta None known

dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe or in the spring[200]. Stored seed should be pre-soaked for 24 hours in warm water. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Great care is needed since the plant dislikes root disturbance[200].

nwatta Easily grown in ordinary garden soil in a sunny position, preferring a deep well-drained sandy loam[1, 200]. Plants strongly resent root disturbance and should be placed in their permanent positions as soon as possible[1]. The var. *H. alpinum americanum*. Michx. is used for food[61, 177]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.2.9 Amelanchier x grandiflora

Apple Serviceberry

4 tlin 7 cyuc 5 kcaak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprikl hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier x grandiflora is a deciduous Shrub growing to 6 m (19ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[200]. Sweet and succulent with a flavour of apples[K], they can also be dried for later use[183]. The fruit is rich in iron and copper[226]. It is up to 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Landscape Uses: Firewood, Specimen, Woodland garden. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Prefers an acid or neutral soil. Plants are hardy to about -25°C[184]. This species does not produce suckers[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. This species is occasionally cultivated for its edible fruits, there are some named varieties[200]. The fruit is freely produced in Britain[184]. Considerable confusion has existed between this species, *A. arborea*, *A. canadensis*, *A. lamarckii* and *A. laevis*, see [11 and 200] for the latest (1991) classification. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:Not North American native, Attracts butterflies, Blooms are very showy.

### 5.2.10 Corylus avellana

Common Hazel, Common filbert, European Filbert, Harry Lauder's Walking Stick, Corkscrew Hazel, Hazel  
4 tlin 8 cyuc 5 kcaak 5 tcan 2 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatpriklwisslip hpa7tmwatli dyat hjonli

drutta Corylus avellana is a deciduous Tree growing to 6 m (19ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from January to April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay)

soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil Oil SeedEdible Uses: Milk Oil OilSeed - raw or roasted and used in breads, cakes, biscuits, sweets etc[2, 5, 9, 12, 13, 34, 183]. An excellent nut for raw eating[K]. They can also be liquidized and used as a plant milk[183]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. A clear yellow edible oil is obtained from the seed[7, 9, 183]. It is used in salad dressings, baking etc.

tcanta Basketry Charcoal Cosmetic Hedge Hedge Miscellany Oil Oil Plant support Polish Tannin WoodThe seed contains up to 65% of a non-drying oil, used in paints, cosmetics etc[13, 46, 57, 132]. The whole seed can be used to polish and oil wood[6]. It is very easy to apply and produces a nice finish[K]. The finely ground seeds are used as an ingredient of face masks in cosmetics[7]. Plants can be grown as a tall hedge[29]. They need to be left untrimmed or only lightly trimmed if seed is required[29]. The bark and leaves are a source of tannin[7]. Wood - soft, easy to split, not very durable, beautifully veined. Used for inlay work, small items of furniture, hurdles, wattles, basketry, pea sticks etc[7, 13, 23, 46, 61, 63, 66, 125]. The twigs are used as dowling rods by water diviners[11]. The wood also yields a good quality charcoal, used by artists[63, 101].

dwatta Antihelmintic Astringent Diaphoretic Febrifuge Miscellany Nutritive Stomachic TonicThe bark, leaves, catkins and fruits are sometimes used medicinally[7]. They are astringent, diaphoretic, febrifuge, nutritive and odontalgic[7]. The seed is stomachic and tonic[240]. The oil has a very gentle but constant and effective action in cases of infection with threadworm or pinworm in babies and young children[7].

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Global Crop Industrial Crop: Biomass Managen Coppice Management: Standard Staple Crop: Protein-oilLandscape Uses:Container, Standard, Specimen. An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Succeeds in a pH range 4.5 to 8.5, but prefers a range of 5 to 7[200]. Plants are fairly wind tolerant[1, 11]. A very hardy plant, succeeding in all areas of Britain[200]. The flowers, however, are produced in late winter and early spring and can be damaged by heavy frosts at this time[200]. A parent, together with *C. maxima*, of many cultivated forms of filberts and cob nuts. There are many named varieties[11]. Plants are self-fertile but a more certain crop is obtained if more than one cultivar is grown[200]. The main difference between cob nuts and filberts is that the husk of a filbert is longer than the seed and often completely encloses it, whilst the husk on a cob nut is shorter than the seed[200]. Squirrels are a major pest of this plant, often decimating the crop of nuts[200]. Often grown as a coppiced shrub in woodlands, the stems have a variety of uses[23, 67, 186]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. A food plant for the caterpillars of many lepidoptera species[30]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone



damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface. The root pattern is suckering with new plants from runners away from the plant [2-1].

## 5.2.7 Rubus procerus

Himalayan Giant Blackberry

4 tin 8 cyuc 5 kcaak 1 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta Rubus procerus is a deciduous Shrub growing to 10 m (32ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, cakes etc[3, 105, 183]. The fruit can also be dried for later use[183]. Very large for a blackberry[50, 183] with a very pleasant rich flavour when fully ripe[K].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. A form of this species, known as 'Himalayan giant', is commonly cultivated in temperate zones for its edible fruit[50]. Although a blackberry, the stems are often perennial and can fruit for more than one year[50]. This name may be wrongly applied. According to the new RHS Dictionary of Gardening, the correct name for the 'Himalayan Giant' blackberry is *R. procerus*. P.J.Muell., the name *R. discolor* is misspelled. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.8 Crataegus pedicellata

Scarlet Haw, Scarlet hawthorn

4 tin 8 cyuc 5 kcaak 2 tcan 2 dwat 7 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

drutta Crataegus pedicellata is a deciduous Shrub growing to 7 m (23ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy

clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. A very variable species, especially in its fruit which ranges considerable in size and quality[K]. Up to 10mm long and pear shaped, the flesh is sweet but dry and mealy[200]. Another report says that the fruit is up to 20mm in diameter[235] and we have often seen fruits this size, or even a bit larger[K]. We find the fruits of the best forms to have an excellent flavour and juicy texture when fully ripe, but with a hint of bitterness before then[K]. They are one of the later members of this genus to ripen their fruit[K]. The fruit can be used in making pies, preserves, etc. and can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Plants are hardy to at least -18°C[202]. A very variable species, it has been divided up into several different species by some botanists[82]. The sub-species *C. pedicellata gloriosa*. Sarg. has larger fruits than the type[11]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A user in Poland says that *Crataegus pedicellata* exists in the wild in Eastern Poland and can support winter temperatures at least until -30C.

## 5.1.25 Sophora japonica

Japanese Pagoda Tree, Scholar Tree

tfo2n 4 tin 9 cyuc 2 kcaak 2 tcan 3 dwat 20 m hkuc htut cyutli hgattcup hwicli hyshrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Sophora japonica is a deciduous Tree growing to 20 m (65ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in September, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Rutin TeaYoung leaves and flowers - cooked[177, 183]. The leaves need to be cooked in three lots of water in order to remove the bitterness[179]. This will also remove most of the vitamins and minerals[K]. The leaves are a rich source of rutin, they contain much more than the usual commercial source, buckwheat (*Fagopyrum esculentum*)[174]. The ovaries, before the flowers open, contain up to 40% rutin[218]. A tea can be made from the young leaves and flowers[183]. An edible starch is obtained from the seed[183].

tcanta Dye WoodA yellow dye is obtained from the seed-pods and the flowers[46, 61, 109, 178]. It is green when mixed with indigo[151]. Wood - tough, light, strong, of superior quality. Used in carpentry[109, 174].

dwatta Abortifacient Antibacterial Anticholesterolemic Anti diarrhoeal Antinflammatory Antispasmodic Diuretic Emetic Emollient Epilepsy Febrifuge Hypotensive Purgative Skin Styptic TonicThis species is commonly used in Chinese medicine and is considered to be one of the 50 fundamental herbs[218]. It came second in a study of 250 potential antifertility agents[218]. Diuretic, emollient, febrifuge, tonic[11, 147, 174, 178]. The flowers and flower buds are antibacterial, anticholesterolemic, anti-inflammatory, antispasmodic, haemostatic and hypotensive[11, 147, 174, 176, 178, 218, 238, 279]. The ovaries, especially just before the plant flowers, are a rich source of rutin and this is a valuable hypotensive agent[218]. The buds, flowers and pods are concocted and used in the treatment of a variety of ailments[218] including internal haemorrhages, poor peripheral circulation, internal worms etc[238]. This remedy should not be prescribed for pregnant women[238]. The seedpods are abortifacient[218]. The seed is emetic and haemostatic[218]. It is used in the treatment of haemorrhoids, haematuria, uterine bleeding, constipation, stuffy sensation in the chest, dizziness, red eyes, headache and hypertension[176]. It should be used with caution since it is toxic[218]. The leaves are laxative[218]. They are used in the treatment of epilepsy and convulsions[218]. A decoction of the stems is used in the treatment of piles, sore eyes and skin problems[218].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Pre-soak stored seed for 12 hours in hot (not boiling) water and sow in late winter in a greenhouse[78]. Prick out the seedlings as soon as they are large enough to handle into individual pots in the greenhouse, and grow them on for 2 years under protected conditions. Plant them out into their permanent positions in early summer of their third year. Cuttings of young shoots with a heel, July/August in a frame[11]. Air-layering[200].

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen, Street tree. Succeeds in a well-drained moderately fertile soil in full sun[200]. Tolerates poor soils, atmospheric pollution, heat and, once established, drought[200]. Hardy to about -25° when mature, but it can be damaged by severe frosts when it is young[200]. A very ornamental[1] and fast growing tree[200], it grows best in hot summers[188]. It grows best in the warmer areas of the country where the wood will be more readily ripened and better able to withstand winter cold[219]. Trees take 30 years to come into flower from seed.[200], but they do not often ripen their seed in Britain[11]. Cultivated in China for the rutin contained in its leaves and ovaries[218]. Plants should be container-grown and planted out whilst young, older plants do not transplant well[219]. Plants in this genus are notably re-

sistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features: Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 5.1.26 Ceanothus fendleri

Fendler's Ceanothus

tfo2n 4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Ceanothus fendleri is a deciduous Shrub growing to 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit Inner barkEdible Uses: TeaFruit[105, 155, 161, 177]. Used for food in New Mexico[183]. The berries are sweetened with sugar and used as food[257]. The fruit is about 5mm wide[200]. Strips of the inner bark can be eaten in the summer[257]. The leaves are used as a substitute for tea[183].

tcanta Dye SoapA green dye is obtained from the flowers[168]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[155, 168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta SedativeThe plant is sedative[155]. An infusion has been used to treat nervousness and a poultice of the plants also used for this purpose[257]. The leaves have been chewed to treat a sore mouth[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place in 1 - 2 months at 20°C[138]. One report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to

pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. One of the hardiest members of this genus, it succeeds outdoors in many areas of the country[11]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Any pruning is best carried out in the spring[219]. Fast growing, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

### 5.1.27 Ceanothus sanguineus

Oregon Tea Tree, Redstem ceanothus  
tfo2n 4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc  
hmmihmtut cyutli kyuctcup hwicli hrasljut hpa7tli flatpricklwis hpa7tmwatli xre7t hjonli

drutta Ceanothus sanguineus is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: TeaA tea is made from the leaves[177, 183].

tcanta Dye SoapA green dye is obtained from the flowers[168]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta PoulitceA poultice of the dried, powdered bark has been applied to burns, sores and wounds[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place within 1 - 2 months at 20°C[138]. One report says that the stored seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. It then requires a period of chilling below 5°C for up to 84 days before it will germinate[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Any pruning is best

carried out in the spring[219]. Fast growing, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

### 5.1.28 Ceanothus velutinus

Sticky Laurel, Snowbrush ceanothus, Hooker's ceanothus  
tfo2n 4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 2.5 m hkuc  
hmmihmtut cyutli kyuctcup hwicli hrasljut hpa7tli flatpricklwis hpa7tmwatli xre7t hjonli

drutta Ceanothus velutinus is an evergreen Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea substitute[177, 183].

tcanta Baby care Dye Insecticide SoapA green dye is obtained from the flowers[168]. A poultice of the dried powdered leaves has been used as a baby powder for treating nappy rash etc[257]. Smoke from burning the plant has been used as an insecticide to kill bedbugs[257]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[168, 169, 212]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta Analgesic Antirheumatic Eczema Febrifuge Poulitce SkinThe leaves are febrifuge[257]. An infusion has been used in the treatment of coughs and fevers[257]. A decoction of the leaves and stems has been used both internally and externally in the treatment of dull pains, rheumatism etc[257]. The leaves contain saponins and have been used as a skin wash that is also deodorant and can destroy some parasites[257, K]. The wash is beneficial in treating sores, eczema, nappy rash etc[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place within 1 - 2 months at 20°C[138]. One report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. It then requires a period of chilling below 5°C for up to 84 days before it will germinate[214]. Seeds have considerable longevity, some that have been in the soil for 200 years or more have germinated[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. One report says that this species is hardy to zone 5 (tolerating temperatures down to about -20°C)[200] whilst another says that it needs the protection of a wall when grown outdoors in Britain[1]. Plants dislike root disturbance, they should be planted out into their permanent posi-

October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit SapEdible Uses: Fruit - raw, cooked or dried for later use[1, 3, 61, 105]. Sweeter than A. deliciosa, the kiwi fruit[183], the skin is smooth and can be eaten with the fruit[K]. The fruit contains up to 5 times the vitamin C content of blackcurrants[74]. Highly esteemed according to one report[151] whilst another says that they are insipid[11]. The fruits are greenish-yellow or purple-red when mature and are about 2 to 3cm long[198, 266]. They contain a number of small seeds, but these are easily eaten with the fruit[K]. The plant is rich in sap and this can be tapped and drunk in the spring[105, 177, 183].

tcanta None known

dwatta Vitamin CNone known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, so they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Tolerates acid and moderately alkaline soils[202]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. A very hardy plant, tolerating temperatures down to -30°C or more, but the young spring growth is susceptible to frost damage[160]. Some cultivars are said to tolerate temperatures down to about -50°C when fully dormant[160]. This species is often cultivated for its edible fruit and it is increasingly being seen as having potential in Britain. There are some named varieties[183]. Plants are usually dioecious but the cultivar 'Is-sai' is self-fertile[200]. A polymorphic species[74]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. Plants only flower when grown in warm climates[202]. This species flowers well in gardens in the south and west of Britain[219], the small flowers being sweetly scented[245]. This is a climbing plant, supporting itself by twining around branches etc[200]. Male and female plants must usually be grown if seed is required. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

### 5.2.6 Prunus domestica

Plum, European plum  
4 tlin 9 cyuc 5 kcaak 3 tcan 2 dwat 12 m hkuc

hmmihmtut cyutli tcup hwicli hrasljutnykriqip hpa7tli flatpricklwis hpa7tmwatli fyfikre7t hjonli

drutta Prunus domestica is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from July to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Fruit Oil Seed Edible Uses: Gum Oil Oil TeaFruit - raw or cooked[1, 2, 7, 46]. The fruit varies considerably from cultivar to cultivar, but it is generally somewhat mealy, soft and juicy with a delicious flavour ranging from very sweet to acid[K]. The more acid fruits are usually only used for cooking purposes[K]. The fruit varies widely in size according to cultivar but can be 8cm long and contains a single large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible gum is obtained from points of damage on the trunk[64]. The seed contains about 20% of an edible semi-drying oil[4, 57]. It has an agreeable almond smell and flavour[4]. The flowers are eaten. They are used as a garnish for salads and ice cream or brewed into a tea[183].

tcanta Adhesive Dye Gum Oil Oil WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. A yellow dye is obtained from the bark[115]. A gum obtained from points of damage along the stem can be used as an adhesive[64]. The ground up seeds are used cosmetically in the production of face-masks for dry skin[7]. A semi-drying oil is obtained from the seed[64]. No details of its uses. Wood - hard, compact. Used for musical instruments[115].

dwatta Febrifuge Laxative StomachicThe dried fruit, known as prunes, is a safe and effective laxative and is also stomachic[4, 7, 21, 238]. The bark is sometimes used as a febrifuge[7]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Requires a well-drained moisture retentive soil[1, 11] and a sheltered position[200]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Grows well in heavy clay soils. Prefers some chalk in the soil but it is apt to become chlorotic if too much is present[1]. Prefers a pH between 6 and 6.5[200]. The plum is widely cultivated for its edible fruit in temperate zones, there are many named varieties able to supply fresh fruits from late July to November or December[183]. Many cultivars are fully self-fertile, though some are partially self-sterile and others require cross-pollination[200]. Where space is at a premium, or at the limits of their climatic range, plums can be grown against a wall. Most cultivars will grow well against a sunny south or west facing wall, whilst an east facing wall will suit some of the tougher cultivars, a north facing wall is not really suitable[219]. This species is probably a hybrid of ancient origin between *P. spinosa* and *P. cerasifera*, coupled with chromosome doubling[17]. It does not cross-pollinate with the Japanese plum, *P. salicina*[200]. Prefers growing in a continental climate, mild winters tend to encourage earlier flowering with a greater risk of frost damage to the blossom. In Britain the best fruits are produced away from the western side of the country. Most members of this genus are shallow-rooted and will produce suckers if the roots are

## 5.2.3 *Corylus hybrids*

Hybrid and Neohybrids, Hazel, Filbert

4 tlin 9 cyuc 5 kcaak 5 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikli-wisslip hpa7tmwatli hjonli

drutta *Corylus hybrids* is a deciduous Shrub growing to 25 m (82ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Carbon Farming Solutions - Staple Crop: protein-oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world). Hazelnuts are among the best perennial protein and oil staple crops for temperate and boreal climates. Hybrids and neohybrid hazels are of increasing importance [1-1].

tcanta Carbon Farming Solutions - Other Systems: woody agriculture. See individual species.

dwatta See individual species.

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Climate: boreal to warm temperate, Mediterranean. Humidity: semi-arid to humid. Carbon Farming Solutions - Cultivation: new crop. Management: standard, coppice (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.4 *Diospyros virginiana*

American Persimmon, Common persimmon, Persimmon

4 tlin 8 cyuc 5 kcaak 3 tcan 1 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Diospyros virginiana* is a deciduous Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Insects, wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: Coffee Oil Sweetener TeaFruit - raw, cooked or dried and used in breads, cakes, pies, puddings etc[46, 183]. About the size of a plum, the fruit has an exquisitely rich flavour when it is fully ripe (and almost at the point of going bad) but it is very harsh and astringent before then[2, 3, 171, K]. The fruit may not ripen properly in a cool summer, though if it is frosted it normally develops a very good flavour[K]. The fruit can also be harvested in the autumn, preferably after a frost, and bletted. (This is a process where the fruit is kept in a cool place and only eaten when it is very soft and almost at the point of going rotten). Much of the fruit on trees in a relatively sunny position at Kew after a relatively warm summer in 1996 was still not fully ripe, though it was very nearly so and ripened well off the tree[K]. The fruit can also be dried and used in bread, cakes etc. The fruit is up to 4.5cm in diameter[200]. Molasses can be made from the fruit pulp[183]. An oil obtained from the seeds is said to taste like peanut oil[222]. A

tea is made from the dried leaves[102]. It is high in vitamin C and has a pleasant flavour somewhat like saffrafras[21, 183]. The roasted seed is used as a coffee substitute[177, 183].

tcanta Oil Soil stabilization WoodCan be used as a rootstock for D. kaki[46]. Wood - strong, hard, heavy, fine-grained, elastic, resistant to wear. A valuable wood, it is used for making wooden ware, turnery etc[46, 82, 149, 171]. It is used especially for making handles for golf clubs[149].

dwatta Antiscorbutic Astringent Vitamin C WartsA decoction of the boiled fruit was used to treat bloody stools[213]. (This probably refers to the unripe fruit, which is very astringent[K]). The leaves are rich in vitamin C and are used as an antiscorbutic[213]. A decoction of the inner-bark is highly astringent[149, 222]. It has been used as a mouth rinse in the treatment of thrush and sore throats[213, 222]. Used externally as a wash for warts or cancers[222].

propta Seed - best sown in a cold frame as soon as it is ripe[113, 200]. Stored seed requires cold-stratification and should be sown as early in the year as possible[78]. It usually germinates in 1 - 6 months at 15°c[175]. Pot up the young seedlings as soon as they are large enough to handle into fairly deep pots and plant them out in early summer. Give the plants some protection from winter cold for their first winter or two outdoors. Cuttings of half-ripe wood, July/August in a frame[200]. Layering in spring[200].

nwatta Requires a good deep loamy soil in sun or light shade[200]. If being grown for its fruit, the tree requires a warm, sunny, sheltered position[K]. It dislikes very acid or wet and poorly drained soils[200]. Plants are somewhat tender when young[11], though dormant mature trees are hardy to about -35°c[160]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Dioecious, but the female tree can produce seedless fruits in the absence of a pollinator[1]. It is likely that unfertilized fruits are more astringent than fertilized fruits since this is the case with D. kaki[K]. Trees can start producing fruit when only a few years old, a specimen seen at Kew Botanical gardens in autumn 1996 was only 1.5 metres tall and was bearing a very large crop of fruit[K]. This species is occasionally cultivated for its edible fruit, there are several named varieties[82, 183]. 'Dooley' grows well near the northern limits of persimmon culture[183]. 'Geneva Red' also grows well at the northern limits of persimmon culture. The fruit is medium to large[183]. 'Meader' grows well in cooler areas, it is self-fertile[183]. Plants have a long tap root and are difficult to transplant[149, 200], it is best to plant them out in their permanent position as soon as possible and to give protection overwinter for the first year or two[K]. The ssp. D. virginiana platycarpa has sweet succulent flesh, it grows wild from Missouri to Arkansas[82]. Special Features: Attracts birds, North American native, Attracts butterflies, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.5 *Actinidia arguta*

Tara Vine

4 tlin 8 cyuc 5 kcaak 2 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Actinidia arguta* is a deciduous Climber growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from May to November, in flower from June to July, and the seeds ripen in

tions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Plants flower on the previous year's growth, if any pruning is necessary it is best carried out immediately after flowering has finished[200, 219]. Constant pruning to keep a plant small can shorten its life[200]. Fast growing, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. The leaves have a strong scent of balsam[200]. Some members of this genus have a symbiotic relationship with certain soil microorganisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

## 5.1.29 *Vicia gigantea*

Giant Vetch

tfo2n 4 tlin 8 cyuc 2 kcaak 3 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta *Vicia gigantea* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Young seed - raw or cooked[256]. The seeds are produced in pods 2 - 5cm long, each pod containing 3 - 4 round seeds the size of small peas[256]. They are eaten, when young, like green peas[2, 105, 118, 161], the flavour even of young seeds is rather strong, like old garden peas[256]. Some native North American Indian tribes regarded the seeds as poisonous, though other tribes would eat them as a snack. The pods were harvested when green and then roasted in an open fire until the pods started to split open. The seeds were then removed and eaten[256].

tcanta HairAn infusion of the roots has been used as a tonic hair wash and anti-dandruff treatment[257]. Nitrogen fixer. Dynamic accumulator.

dwatta Antidandruff LaxativeThe roots are laxative[257]. An infusion of the roots has been used as a tonic hair wash and anti-dandruff treatment[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of the country. The following notes are based on the general needs of the genus. Prefers a fairly heavy loam but succeeds in a sunny position in most soils that are well-drained[200]. Grows well in heavy clay soils.

## 5.1.30 *Galega officinalis*

Goat's Rue, Professor-weed

tfo2n 4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Galega officinalis* is a PERENNIAL growing to 1.2 m (4ft) by 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Curdling agentLeaves - cooked[2]. Used like spinach[177, 183]. Some caution is advised due to reports of possible toxicity. The herb is used as a substitute for rennet in curdling plant milks etc[183].

tcanta Cosmetic Green manureA fast-growing plant, it makes a good green manure crop, enriching the soil with or-

ganic matter and also fixing atmospheric nitrogen[7]. The plant is used cosmetically in hand and foot baths[7].

dwatta Diaphoretic Diuretic Galactogogue HypoglycaemicGoat's rue was once important in the treatment of plague, fevers and infectious diseases[238]. It is still used in modern herbalism, though mainly for its effect in promoting milk-flow in lactating mothers (it has been shown to increase the flow of milk in cows and goats by 35 - 50%[4, 7, 238]) and for its positive effect on the digestive system[238]. The plant contains galegine, an alkaloid that strongly reduces blood sugar levels which make it useful in the treatment of diabetes[254]. The leaves and flowering tops are diaphoretic, diuretic, galactogogue and hypoglycaemic[4, 7, 21, 165]. It has also been used in the treatment of fevers[4, 7]. It is taken internally to treat insufficient lactation, late-onset diabetes, pancreatitis and digestive problems, especially chronic constipation caused by a lack of digestive enzymes[238]. The plant is harvested as it is just coming into flower and is dried for later use[4]. Some caution is advised, see notes above on toxicity.

propta Seed - pre-soak for 12 hours in warm water and then sow the seed in spring or autumn in a cold frame[111, 200]. Spring-sown seed can be slow to germinate, a period of cold stratification may improve the germination time. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. If you have sufficient seed, then it is possible to sow outdoors in situ in mid to late spring. Division in spring or autumn[111]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils but repays generous treatment[1, 200]. Prefers full sun and a deep moist soil[1, 4] but it also succeeds in light shade[200]. Grows well even in poor soils[233]. Plants are very tolerant of neglect and can be grown in quite coarse grass, which can be cut annually in the autumn[233, 238]. A long-lived plant[1], it can be invasive in good growing conditions[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.31 *Ceanothus ovatus*

Smaller Red-Root

tfo2n 4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli kyucctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ceanothus ovatus* is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: TeaThe young leaves and flowers are steeped in boiling water for about 5 minutes. The resulting liquid is yellowish in colour and tastes similar to Oriental tea but is considered milder and sweeter[183].

tcanta Dye Miscellany SoapA green dye is obtained from the flowers[168]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta MiscellanyA decoction of the roots has been used as a cough remedy[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°c[138, 200]. Germination usually takes place within 1 - 2 months at 20°c[138]. One report says that the seed is best

given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Any pruning is best carried out in the spring[219]. Fast growing, it flowers well when young, often in its second year from seed[11]. Closely related to *C. americanus*[235]. It hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

### 5.1.32 *Vicia americana*

American Vetch, Mat vetch

tf02n 4 tin 7 cyuc 2 kcaak 4 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta *Vicia americana* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Seed Seedpod ShootsEdible Uses: Young shoots - cooked[105, 155, 161]. The tender seeds are eaten by the N. American Indians[212]. Both the mature seeds and the immature seedpods can be used[257]. The pod is about 3cm long and contains 4 - 7 seeds[235].

tcanta StringThe stout roots have been used for tying[257]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Nitrogen Fixer.

dwatta Ophthalmic Salve StingsThe leaves have been rubbed in the hands and applied to spider bites[257]. An infusion of the crushed leaves have been used as a bath for treating soreness[257]. An infusion of the plant has been used as an eyewash[257]. An infusion of the leaves has been used by women as a love medicine[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of the country. The following notes are based on the general needs of the genus. Succeeds in any well-drained soil in a sunny position if the soil is reliably moist throughout the growing season, otherwise it is best grown in semi-shade[200]. A climbing plant, attaching itself to supports by means of tendrils[212]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also

be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.1.33 *Medicago lupulina*

Black Medick

tf02n 4 tin 8 cyuc 2 kcaak 4 tcan 1 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta *Medicago lupulina* is a ANNUAL/PERENNIAL growing to 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - cooked[105]. Used as a potherb[183]. A nutritional analysis is available[218]. Seed - cooked[2, 105, 161]. Parched and eaten or ground into a powder[183]. The seed is said to contain trypsin inhibitors[218]. These can interfere with certain enzymes that help in the digestion of proteins, but are normally destroyed if the seed is sprouted first.

tcanta Green manureA good green manure plant, it is fairly deep rooted, has good resistance to 'Clover rot' but it is not very fast growing[87]. It can be undersown with cereals, succeeding even in a wet season[87].

dwatta Antibacterial LentiveAqueous extracts of the plant have antibacterial properties against micro-organisms[218, 240]. The plant is lenitive[218, 240]. One of our users has sent the following information 'Trypsin inhibitors can be inactivated by the application of heat, for example, boiling for 9 minutes. (Trypsin inhibitors are found in soy). L-canavanine can be destroyed by heat as well. Major saponins in alfalfa but also black medick, known as medicagenic acid and its derivatives, have major antifungal/antimycotic activity that could lend to better medical applications than existing antimycotic drugs that are limited in number and abilities. Medical applications meaning mycoses, which is a consequence of widespread use of immunosuppressive drugs used in transplants, cytotoxic chemotherapy in cancer treatments, broad spectrum antibiotics, recurring mycotic infections in those suffering of AIDS, and a recent hazard of previously agricultural niche saprophyte fungi that are becoming etiological agents and are relatively resistant to conventional therapies.'

propta Pre-soak the seed for 12 hours in warm water and then sow in spring in situ[200]. The seed can also be sown in situ in autumn. Green manure crops can be sown in situ from early spring until early autumn[87]. (the later sowings are for an over-wintering crop)

nwatta Dislikes acid soils[87]. (This conflicts with the notes on its habitat above.) Dislikes shade. A good food plant for many caterpillars[30]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

### 5.1.34 *Vicia hirsuta*

Hairy Tare, Tiny vetch

tf02n 4 tin 9 cyuc 2 kcaak 3 tcan 0 dwat 0.5 m hkuc

and often sold in health shops etc[226]. Lime flowers are said to develop narcotic properties as they age and so they should only be harvested when freshly opened[238]. A charcoal made from the wood is used in the treatment of gastric or dyspeptic disturbances and is also made into a powder then applied to burns or sore places[4]. It is also quite an effective vasodilator[7].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Landscape Uses:Espalier, Pollard, Screen, Specimen. Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soils[200]. Succeeds in sun or semi-shade[188]. Plants can be transplanted quite easily, even when quite large, trees up to 60 years old have been moved successfully[1, 74]. Lime trees are very long-lived[7] and are amenable to coppicing or pollarding. This species does not produce many suckers[98, 200]. Grows well in Britain, it is the only species that reliably produces viable seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of shade[200]. Mature trees cast a dense shade[186]. A very valuable bee plant, producing an abundance of nectar[7, 11, 125]. A valuable tree for wildlife, there are 31 species of insects associated with this tree[24]. A food plant for the caterpillars of many butterfly and moth species[30]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. There are some named varieties selected for their ornamental value[188]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 5.2.2 *Quercus ilex*

Holly Oak, Evergreen Oak

4 tin 10 cyuc 5 kcaak 3 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwisliphosm hpa7tmwatli hjonli

drutta *Quercus ilex* is an evergreen Tree growing to 25 m (82ft) by 20 m (65ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: Coffee OilSeed - raw or cooked[1, 2, 46, 61]. It can be sweet or bitter[K]. The seed is up to 3cm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed from some trees contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many

minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute. An edible oil is obtained from the seed[183]. One reader noted the *Q. suber* population of the Mamora forest in Morocco contains only sweet acorns and can be eaten raw, it has a similar taste to raw chestnuts. The skin removes quite easily *Quercus ilex* also exists with tannin-free acorns in the Moroccan forests, the locals say around 20 percent are sweet.

tcanta Fodder Fuel Hedge Hedge Oil Repellent Shelterbelt Tannin WoodLandscape Uses: Specimen, Street tree. A much of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Very tolerant of maritime exposure and of trimming, it can be grown as a shelterbelt tree or hedge in maritime areas[11, 29, 49, 75]. Wood - strong, hard, durable. Used for furniture[46, 61, 89]. It makes a good charcoal[89] and a good fuel, burning well even if green[146]. The bark is a source of tannin[146]. Heat Zone: 9-2.

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Fodder: Mast Industrial Crop: Tannin Management: Standard Other Systems: Dehesa Regional Crop Staple Crop: Balanced carbPrefers a good deep fertile loam which can be on the stiff side[11]. Thrives on shallow chalky soils[188]. Succeeds in all soils except those that are cold and poorly drained[98]. Grows well in sandy soils[188]. Young plants tolerate reasonable levels of side shade[200]. Very resistant to maritime exposure[11, 49, 75]. A very ornamental tree[1] but it is quite slow-growing[75]. Transplants badly unless moved regularly and this should be done as growth commences in late May or in September[11]. Fruits very freely in Britain[K]. The seed ripens in its first year[200]. The sub-species *Q. ilex* ballota is cultivated for its sweet-tasting edible seed in Portugal and Spain[K]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200]. Special Features: Not North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 5.1.66 *Alnus maximowiczii*

tf02n 4 tlin 8 cyuc 0 kcak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcuphja7n hwicli hysijlutnykfrp hpa7tli flat-prikliws hpa7tmwatli hjonli

drutta *Alnus maximowiczii* is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta None known

tcanta Charcoal Dye WoodA dye is obtained from the bark[46, 61]. No more details are given. Wood - close grained. Used for turnery, charcoal[46, 61].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. A polymorphic species[58], it is closely related to *A. viridis*[200]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.1.67 *Senna marilandica*

Wild Senna, Maryland senna

tf02n 4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat m hkuc hmimhtut cyutli hgatkuyctcup hwicli hrasjlutnyk hpa7tli flat-prikliws hpa7tmwatli xre7t hjonli

drutta *Senna marilandica* is a deciduous Shrub growing to 1.5 m (5ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

ckakta None known

tcanta None known

dwatta Cardiac Cathartic Diuretic Diuretic Febrifuge Poulrice VermifugeThe leaves and seedpods are cathartic, diuretic and vermifuge[1, 11, 21, 46]. The leaves are harvested before and during flowering, the pods are harvested when fully ripe in the autumn. Both are dried for later use[238]. The leaves are a safe and effective cathartic[207, 213]. They are best used with *Foeniculum vulgare* seeds in order to counteract a tendency to cause gripe[207, 213]. The seedpods can also be used and are milder but slower in their action[222]. The seeds have been soaked in water until they are mucilaginous and then swallowed as a treatment for sore throats[213, 257]. The root is cardiac and febrifuge[257]. An infusion

has been used in the treatment of fevers and heart problems[257]. A poultice of the root has been used in treating sores[257].

propta Seed - scarify and then pre-soak the seed for 2 - 3 hours in warm water before sowing it from early spring to early summer in a warm greenhouse[138]. The seed usually germinates in 1 - 12 weeks at 23°C[138]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse. Do not plant them out until the following spring[138]. Division as growth commences in spring[11]. Cuttings of moderately ripe wood, July in a frame[1].

nwatta Succeeds in most well-drained soils but prefers an open sandy loam in a sunny sheltered position[1, 11, 200]. Established plants are drought tolerant[200]. Succeeds in light shade, but the plant is much less vigorous when grown in dry shade[200]. Although fairly cold-tolerant, plants can be killed in very severe weather, so it is best to mulch the roots of mature plants in bad winters[11]. Younger plants should be mulched each winter until they are well established[200]. Slugs are very attracted to this plant[K]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.2 mran

### 5.2.1 *Tilia platyphyllos*

Large Leaved Lime, Largeleaf linden, Bigleaf Linden

4 tlin 6 cyuc 5 kcak 4 tcan 3 dwat 30 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Tilia platyphyllos* is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves SapEdible Uses: Chocolate TeaYoung leaves - raw. A delicious addition to salads and sandwiches, the young leaves are mild and tender with a somewhat mucilaginous texture[K]. A very acceptable chocolate substitute can be made from a paste of the ground-up flowers and immature fruit. Trials on marketing the product failed because the paste is very apt to decompose[2, 115]. A popular herb tea is made from the flowers, it has a sweet, fragrant pleasant flavour. Some caution is advised, see notes above on toxicity. Sap - harvested in the spring, it is sweet and can be used as a drink or concentrated into a syrup[4].

tcanta Charcoal Fibre Paper WoodA fibre from the inner bark is used to make mats, shoes, baskets, ropes etc[1, 13, 14, 46, 61, 100]. It is also suitable for cloth[115]. It is harvested from trunks that are 15 - 30cm in diameter[115]. The fibre can also be used for making paper[189]. The stems are harvested in spring or summer, the leaves are removed and the stems steamed until the fibres can be stripped. The outer bark is removed from the inner bark by peeling or scraping. The fibres are cooked for 2 hours with lye and then beaten in a ball mill. The paper is beige in colour[189]. Wood - soft, white, easily carved. It is very suitable for carving domestic items and small non-durable items[4, 13, 46, 61, 115]. A charcoal made from the wood is used for drawing and has medicinal properties[7, 46, 61, 115].

dwatta Antispasmodic Diaphoretic Diuretic Expectorant Hypotensive Laxative SedativeLime flowers are a popular domestic remedy for a number of ailments, especially in the treatment of colds and other ailments where sweating is desirable[9]. A tea made from the fresh or dried flowers is antispasmodic, diaphoretic, expectorant, hypotensive, laxative and sedative[4, 9, 13, 226, 238]. Lime flower tea is also used internally in the treatment of indigestion, hypertension, hardening of the arteries, hysteria, nervous vomiting or palpitation[4, 238]. The flowers are harvested commercially

hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliws hpa7tmwatli fyifxre7t hjonli

drutta *Vicia hirsuta* is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked[2, 105, 177]. Used like lentils[2], the seed can be eaten as a staple food[178]. Leaves and stems - cooked[105, 177, 178]. Used as a vegetable[272]

tcanta General insect (especially bees) nectar plant. Shelter plant for beneficial insects including lacewings, parasitic Wasps, beetles and spiders. Pioneer Species - helps reestablish overused or damaged land. Nitrogen Fixing Plant - this plant creates its own nitrogen through a symbiotic relationship with microorganisms (bacteria) in its roots. Dynamic Accumulator Species - Potassium, Phosphorus, Nitrogen.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta Succeeds in any well-drained soil in a sunny position if the soil is reliably moist throughout the growing season, otherwise it is best grown in semi-shade[200]. Occasionally cultivated for its edible seed which is used as a lentil substitute[2]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

### 5.1.35 *Wisteria frutescens*

American Wisteria

tf02n 4 tlin 8 cyuc 1 kcak 3 tcan 0 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Wisteria frutescens* is a deciduous Climber growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: FlowersEdible Uses: The fresh flowers are eaten in tossed green salads[183]. They are said to be excellent when dipped in batter and fried in oil as fritters[183].

tcanta Nitrogen fixer.

dwatta None known

propta The seed does not exhibit any dormancy habits. It can be sown as soon as it is ripe in a cold frame and should germinate in the spring. Pre-soak stored seed for 24 hours in warm water and then sow in a greenhouse in early spring. The seed can also be sown in an outdoor seedbed in late spring[126]. Germination should take place in the first spring, though it can sometimes be delayed for another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Plants are very slow from seed and can take up to 20 years to come into flower[200]. Basal cuttings of side-shoots in early to mid summer in a frame[200]. Take the cuttings as soon as the new growth has hardened sufficiently, each cutting should have 2 - 3 leaves[249]. It can also help to remove a shallow slice of bark from the bottom 15mm of the cutting to expose extra cambium, since this will encourage more callusing and better rooting[249]. When kept in a mist frame with a bottom heat of 27 - 30°C, they will root within 4 weeks and produce well-established plants by the

autumn[249]. Layering in spring. Simply lay any convenient long shoot along the ground and cover it with a shallow layer of soil. The shoot will readily produce roots at intervals along the stem. When these are well formed, the shoot can be divided up into a number of plants. These should be potted up and kept in a lightly shaded position in a greenhouse until well established and can then be planted out as required.

nwatta Prefers a good loamy soil in a sunny south or south-west facing position, sheltered from cold winds and from early morning sun on frosty mornings[11, 200]. Plants can become chlorotic on alkaline soils[200]. A soil that is too rich results in excessive foliage at the expense of flowering[200]. Plants can take a few years to settle down after planting out[219]. Too much shade or too rich a soil are normally the culprits, some form of root restriction can be beneficial[219]. A number of named forms have been selected for their ornamental value[200]. Any drastic pruning is best carried out in the spring, immediately after flowering[249]. Plants are very tolerant of even the most drastic pruning and will re-grow even if cut right back to the base[249]. Plants in this genus are notably susceptible to honey fungus[200]. A climbing plant, twining in an anticlockwise direction around the stems of other plants[249]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plants also form a symbiotic relationship with a mycorrhizal fungus which makes more water, phosphorus and other minerals available to the plants[249]. *Wisteria macrostachya* (Torr. and A.Gray) Robinson and Fer is a synonym of *Wisteria frutescens* (L.) Poir. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

### 5.1.36 *Wisteria venusta*

Silky Wisteria

tf02n 4 tlin 8 cyuc 1 kcak 0 tcan 2 dwat 10 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Wisteria venusta* is a deciduous Climber growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked[105]. Some caution is advised, see notes on toxicity at the top of the page. Young leaves - cooked[61, 105].

tcanta FibreA fibre obtained from the bark is used for making cloth and thread[46, 61, 249].

dwatta Antiinflammatory AntitumorGalls that develop on the plant as a result of infection by the bacterium *Erwinia milletiae* are used in Japanese folk medicine as an anti-inflammatory agent[249]. Recent research has shown that substances in these galls can be used in the treatment of gastric cancer and can also inhibit kin tumour promotion by the Epstein-Barr virus[249].

propta The seed does not exhibit any dormancy habits. It can be sown as soon as it is ripe in a cold frame and should germinate in the spring. Pre-soak stored seed for 24 hours in warm water and then sow in a greenhouse in early spring. The seed can also be sown in an outdoor seedbed in late spring[126]. Germination should take place in the first spring, though it can sometimes be delayed for another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Plants are very slow from seed and can take up to 20 years to come into flower[200]. Basal cuttings of side-shoots in early to mid summer in a frame[200]. Take the cuttings as soon as the new growth has hardened sufficiently, each cutting should have 2 - 3 leaves[249]. It can also help to remove a shallow slice of bark from the bottom 15mm of the cutting to expose extra cambium, since this will encourage more callusing and better rooting[249]. When kept in

a mist frame with a bottom heat of 27 - 30°C, they will root within 4 weeks and produce well-established plants by the autumn[249]. Layering in spring. Simply lay any convenient long shoot along the ground and cover it with a shallow layer of soil. The shoot will readily produce roots at intervals along the stem. When these are well formed, the shoot can be divided up into a number of plants. These should be potted up and kept in a lightly shaded position in a greenhouse until well established and can then be planted out as required.

nwatta Prefers a good loamy soil in a sunny south or south-west facing position, sheltered from cold winds and from early morning sun on frosty mornings[11, 200]. Plants can become chlorotic on alkaline soils[200]. A soil that is too rich results in excessive foliage at the expense of flowering[200]. Hardy to about -20°C[184, 200]. Plants can take a few years to settle down after planting out[219]. Too much shade or too rich a soil are normally the culprits, some form of root restriction can be beneficial[219]. The name for this species was originally based on the cultivated garden form with white flowers. The true wild form is known as *W. venusta violacea*. Rehd[200]. Cultivated as a fibre plant in Japan[61]. There are several named varieties, deleted for their ornamental value[249]. The flowers are scented, the smell can be either sweet or musky according to the variety being grown[249]. The plants flower mainly on short spurs so, if removing unwanted side-branches, it is best to cut them back to 2 - 3 leaves rather than removing them completely since this will encourage the formation of flowering spurs[249]. Any drastic pruning is best carried out in the spring, immediately after flowering[249]. Plants are very tolerant of even the most drastic pruning and will re-grow even if cut right back to the base[249]. A vigorous climbing plant supporting itself by twining around other plants, the shoots twine in an anticlockwise direction[184, 249]. Plants in this genus are notably susceptible to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plants also form a symbiotic relationship with a mycorrhizal fungus which makes more water, phosphorus and other minerals available to the plants[249].

### 5.1.37 Robinia luxurians

New Mexico locust

tfo2n 4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyhisrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Robinia luxurians is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FlowersEdible Uses: Flowers - raw[105].

tcanta Soil stabilization WoodPlants succeed in dry barren sites, their suckering habit making them suitable for stabilizing banks[200]. Wood - heavy, exceedingly hard, strong, close-grained[82].

dwatta None known

propta Seed - pre-soak for 48 hours in warm water and sow the seed in late winter in a cold frame[80]. A short stratification improves germination rates and time[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in the following summer. The seed stores for over 10 years[113]. Suckers taken during the dormant season.

nwatta Succeeds in any soil, preferring one that is not too rich[1, 200]. Requires a well-drained soil, succeeding on dry barren sites[200]. Plants are tolerant of drought and atmospheric pollution[200]. Succeeds in a hot dry position. The branches are brittle and very liable to wind damage[200]. When plants are grown in rich soils they produce coarse and rank growth which is even more liable to wind

damage[11, 200]. Any pruning should be done in late summer in order to reduce the risk of bleeding[200]. Plants in this genus are notably resistant to honey fungus[200]. The flowers are fragrant[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.38 Maackia amurensis

Chinese Yellow Wood, Amur maackia

tfo2n 4 tlin 7 cyuc 1 kcaak 4 tcan 0 dwat 6 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Maackia amurensis is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta WoodWood - heavy, strong, very hard. Used for the interior of houses, utensils, tool handles etc[46, 61]. Nitrogen Fixer.

dwatta None known

propta Pre-soak the seed for 24 hours in hot water and then sow it in a cold frame in the autumn[200]. The seed can also be pre-soaked and sown in late winter in a greenhouse[78]. Variable germination. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Root cuttings 4cm long in December. Good percentage[78].

nwatta Landscape Uses:Pest tolerant, Specimen, Street tree. Succeeds in most soils and situations, including deep soils over chalk and dry soils[1, 200]. Prefers a good soil in a sunny position[1]. Prefers a well-drained sandy soil[245]. A very hardy plant, tolerating temperatures down to about -25°C[200]. A polymorphic species[58]. It is closely related to the genus *Cladrastis*[200], and sometimes included in that genus[245]. Plants flower when quite young[200]. The flowers have a powerful scent of vanilla[245]. Transplants readily, even when fairly large[200], but the mature plants resent pruning[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 5.1.39 Amorpha fruticosa

False Indigo, False indigo bush

tfo2n 4 tlin 8 cyuc 1 kcaak 3 tcan 2 dwat 4.5 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyhisrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Amorpha fruticosa is a deciduous Shrub growing to 4.5 m (14ft 9in) at a medium rate. See above for USDA har-

frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Landscape Uses:Erosion control, Ground cover. Prefers an open well-drained calcareous soil in a sunny position[1, 13, 111]. Tolerates poor soils[200]. Tolerates a pH in the range 4.8 to 7.2. A food plant for the caterpillars of many lepidoptera species[30]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attractive foliage, Invasive, Naturalizing.

### 5.1.63 Amorpha nana

Dwarf Indigobush, Dwarf false indigo, Dwarf Indigo

tfo2n 4 tlin 8 cyuc 0 kcaak 2 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyhisrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Amorpha nana is a deciduous Shrub growing to 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known

tcanta Insecticide Soil stabilizationThe resinous pustules on some species yield the insecticide 'amorpha'[200]. The plant has a strong spreading root system and this makes it useful for controlling soil erosion[200].

dwatta ExpectorantThe plant has been used as a snuff in the treatment of catarrh[257].

propta Seed - pre-soak for 12 hours in warm water and sow early spring in a greenhouse[78, 133]. The seed usually germinates in 1 - 2 months at 20°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, June/July in a frame. High percentage[78]. Cuttings of mature wood of the current seasons growth, autumn, in a sheltered position outdoors. Takes 12 months[78]. Suckers in spring just before new growth begins[200]. Layering in spring .

nwatta Landscape Uses:Erosion control. Prefers a light well-drained sandy soil in sun or light shade[200]. Fairly wind-resistant[200]. A very hardy plant, tolerating temperatures down to about -25c[200]. Plants resent root disturbance, they should be planted out into their final positions whilst small[133]. Plants are said to be immune to insect pests[200]. Flowers are produced on the current season's growth[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Invasive, Naturalizing, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 5.1.64 Lespedeza maximowiczii

tfo2n 4 tlin 8 cyuc 0 kcaak 3 tcan 0 dwat m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lespedeza maximowiczii is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic

(mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta BroomThe twigs are used in making brooms[151]. Nitrogen Fixer.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[11]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the ground in all but very mild winters, though they generally resprout well from the base in the following spring and flower in late summer[182]. Closely related to *L. buergeri*[58]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.65 Baptisia bracteata

Plains Wild Indigo, Longbract wild indigo, False Indigo, Cream Wild Indigo

tfo2n 4 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.7 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Baptisia bracteata is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta None known

tcanta None known

dwatta Alterative AstringentAn ointment made from the ground seeds is applied to the stomach in the treatment of colic[222]. A tea made from the roots is used in the treatment of typhoid and scarlet fever[222]. The leaves are astringent and are applied externally to wounds etc[222]. Recent research suggests that the plant can stimulate the immune system[222].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed should be pre-soaked for 24 hours in warm water and then sown in a cold frame in late winter or early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer or following spring. Division in spring[188]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Border, Ground cover, Seashore. Prefers a deep, well-drained neutral to slightly acid soil in full sun[188, 200]. Grows freely in a loamy soil[1]. Succeeds in a hot dry position. Succeeds in a rich moist soil in sun or light shade[187]. Hardy to about -20°C[187]. Plants have a very deep root system and dislike root disturbance, they should be left alone once they are established[188, 233]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Attractive foliage, North American native, Naturalizing, Attractive flowers or blooms.



heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known  
tcanta Nitrogen fixer. Invertebrates shelter: beneficial for insects and other arthropods [1-2]. The foliage is highly palatable to hoofed mammalian herbivores (Banta and Thro, 1995).

dwatta None known  
propta Seed  
nwatta Prefers full or partial sun, mesic (environment or habitat containing a moderate amount of moisture) to dry conditions, and a somewhat acidic infertile soil where there is reduced competition from other kinds of ground vegetation [1-6]. Bloom Color: Yellow. Bloom Time: May to Sep. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.1.60 Genista germanica

tfo2n 4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli hgatkycutcup hwicli hyishrasjlut hpa7tli frusflat-prikwiisslip hpa7tmwatli xre7t hjonli

drutta Genista germanica is a deciduous Shrub growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known  
tcanta Dye MiscellanyA yellow dye is obtained from the plant[61].

dwatta MiscellanyFormerly cultivated as a medicinal plant[1]. No further details.

propta The seed requires a period of cold stratification and is best sown autumn in a cold frame. Pre-soak stored seed for 24 hours in warm water and sow February in a cold frame. Good germination[78]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Cuttings of half-ripe wood, 5-10 cm with a heel, July/August in a frame. Roots are formed in the spring[11]. Cuttings of ripe wood, 5-10 cm with a heel, September/October in a frame. Good percentage. Plant out the following autumn[78].

nwatta Easily grown in a light well-drained soil in a sunny position[1]. Plants grow very rank in rich soils[11]. Prefers a rather dry soil[11]. Succeeds in acid or basic soils[200]. Plants resent root disturbance and should be placed in their permanent positions as soon as possible[11]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.1.61 Caragana microphylla

Littleleaf Peashrub  
tfo2n 4 tlin 9 cyuc 0 kcak 3 tcan 0 dwat m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Caragana microphylla is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Fodder Hedge Shelterbelt Soil stabilization StrawThis species is planted for dune stabilization and for

soil and water conservation[266]. Carbon Farming - Agroforestry Services: nitrogen, contour hedgerow, windbreak. Fodder: bank.

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[200 ]. It usually germinates in 2 weeks[K J]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78 , 113 , 200 ]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138 J]. Germination usually takes place within 2 - 3 weeks at 20°c[138 J]. Good percentage[11 ]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, mid summer in a frame[113 ]. Layering in spring.

nwatta Agroforestry Services: Contour hedgerow Agroforestry Services: Nitrogen Agroforestry Services: Windbreak Fodder: Bank Management: Coppice Management: Standard Regional CropCaragana microphylla prefers a continental climate with its hot summers, cold winters and usually a clear movement from one season to another. The dormant plant can tolerate temperatures down to at least -30°c, but in more maritime climates it is often tempted to come into growth early and this new growth can easily be damaged by late spring frosts[200 ]. Prefers full sun and a light sandy dry or well-drained soil[1 , 11 , 200 ]. Dislikes damp conditions[1 ]. Does not require a rich soil, succeeding on marginal land[11 ]. Caragana microphylla is a polymorphic species and in some cases with transitional forms[266 ]. Hybrids between this species and Caragana korshinskii may occur where these species are sympatric[266 ]. Plants in this genus are notably resistant to honey fungus[200 ]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200 ]. Climate: boreal to warm temperate. Humidity: arid to semi-arid. Carbon Farming - Cultivation: regional crop. Management: standard, coppice.

## 5.1.62 Coronilla varia

Crown Vetch  
tfo2n 4 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Coronilla varia is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to November, and the seeds ripen from August to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: OilEdible Uses: OilNone known  
tcanta Insecticide Oil Soil stabilizationCan be used as an insecticide[153]. No more details are given. A good ground cover and soil stabilizer for sunny banks and slopes[200, 208]. It grows rampantly and should not be grown with plants less than 1.8 metres tall[208].

dwatta Cardiotonic Emetic SalveThe whole plant, used either fresh or dried is a cardiotonic[9, 13]. It should be used with extreme caution, see the notes above on toxicity[9]. A decoction of the bark has been used as an emetic[257]. The crushed plant has been rubbed on rheumatic joints and cramps[257].

propta Seed - best sown in situ as soon as it is ripe. The seed usually germinates in the autumn. Stored seed can be pre-soaked for 12 hours in warm water and then sown in situ in April[111]. Cuttings of half-ripe shoots with a heel, June/July in a frame. Can also be taken in spring[111]. Division in March[111]. Very easy, larger clumps can be re-planted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold

diness. It is hardy to UK zone 4. It is in flower in July. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: OilEdible Uses: Condiment OilThe crushed fruit is used as a condiment[105, 177, 183].

tcanta Bedding Dye Fodder Insecticide Oil Repellent Shelterbelt Soil stabilizationPlants have an extensive root system and are also fairly wind tolerant, they can be planted as a windbreak and also to prevent soil erosion[200]. Resinous pustules on the plant contain 'amorpha', a contact and stomachic insecticide that also acts as an insect repellent[57, 200]. The stems are used as bedding[61]. The plant contains some indigo pigment and can be used to make a blue dye[169]. Unfortunately, the pigment is only present in very small quantities, there is not enough to harvest commercially[169].

dwatta EczemaA user has recently sent us an article in www.frontiersin.org Amorpha fruticosa - A Noxious Invasive Alien Plant in Europe or a Medicinal Plant against Metabolic Disease? which states "Native Americans of the Great Plains employed several of the more common Amorpha species for a variety of uses. Amorpha fruticosa was used for bedding material, horse feed, arrow shafts, the stems were arranged on the ground to create a clean surface on which to put butchered meat, and name "false indigo" is related to the application of the plant as a blue dye (Hoffman, 1891; Gilmore, 1913, 1919; Smith, 1928; Vestal and Schultes, 1939; Munson, 1981; Kindscher and Noguera, 2002; Austin, 2004; Straub, 2010). For medicinal purposes such as stomach pain, intestinal worms, eczema, neuralgia, and rheumatism, the related species A. canescens was used and its powdered leaves were applied to wounds (Hoffman, 1891; Gilmore, 1913, 1919; Smith, 1928, Straub, 2010). Moreover, reports for medicinal use of Amorpha fruticosa are also available: The Semeioles used infusion from leaves and stems as a general tonic and also against rheumatism and chronic sickness together with other plants; the Omaha used the plant to cure wounds (Munson, 1981; Austin, 2004)." We will research and update this section soon.

propta Seed - pre-soak for 12 hours in warm water and then sow early spring in a greenhouse[78, 133]. The seed usually germinates in 1 - 2 months at 20°c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, June/July in a frame. High percentage[78]. Cuttings of mature wood of the current seasons growth, autumn, in a sheltered position outdoors. Takes 12 months[78]. Suckers in spring just before new growth begins[200]. Layering in spring .

nwatta Agroforestry Services: Alley crop Agroforestry Services: Contour hedgerow Agroforestry Services: Nitrogen Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Pesticide Management: Coppice Minor Global CropPrefers a light well-drained sandy soil in sun or light shade[184, 200]. Plants are fairly wind-resistant[200]. A very hardy plant, tolerating temperatures down to about -25c[184, 200]. A polymorphic species, there are many named forms[43]. The flowers have a vanilla perfume[245]. Plants resent root disturbance, they should be planted out into their final positions whilst small[133]. Trees only ripen their seed in fine autumns[80]. Plants are said to be immune to insect pests[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates

that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.1.40 Trifolium macrocephalum

Bighead Clover, Largehead clover  
tfo2n 4 tlin 8 cyuc 1 kcak 3 tcan 0 dwat m hkuc  
htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Trifolium macrocephalum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked and used as a greens[212].

tcanta Dynamic accumulator.  
dwatta None known  
propta Pre-soak the seed for 12 hours in warm water and then sow in spring in situ. If the seed is in short supply it might be better to sow it in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. Division in spring.

nwatta Succeeds in a moist, well-drained circum-neutral soil in full sun[200]. Succeeds in poor soils. It grows well in an apple orchard, the trees will produce tastier fruit that stores better[201]. It should not be grown with camellias or gooseberries because it harbours a mite that can cause fruit drop in the gooseberries and premature budding in the camellias[201]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Buttercups growing nearby depress the growth of the nitrogen bacteria by means of a root exudate[201].

## 5.1.41 Alnus viridis crispa

American Green Alder  
tfo2n 4 tlin 8 cyuc 1 kcak 3 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hysjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Alnus viridis crispa is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FlowersEdible Uses: Catkins - raw or cooked. A bitter taste[172].

tcanta Dye TeethAn orange-red to brown dye can be obtained from the bark[257]. Nitrogen fixer.

dwatta Abortifacient Appetizer Astringent Emetic Emmenagogue Haemostatic Poultice Skin Stomachic Tonic-The bark is astringent, emetic, haemostatic, stomachic and tonic[172]. The bark was burnt as an inhalant in the treatment of rheumatism[257]. The ashes were also used as a tooth cleaner[257]. A decoction of the inner bark has been used as a carminative to reduce gas in the stomach and as a febrifuge[257]. A decoction of the plant has been used in a steam treatment to bring about menstruation - it has been used as an abortifacient[257]. A poultice of the leaves has

been used to treat infected wounds or sores[257]. The poultice was left in place over the wound until the leaves stuck to it and was then pulled off, removing the 'poison' with it[257]. An infusion of the plant tops was given to children with poor appetites[257].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils. A useful plant for cold damp places[11]. Tolerates lime and very infertile sites[11, 200]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.1.42 Robinia neomexicana

New Mexico Locust, Rusby’s locust, Locust tfo2n 4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Robinia neomexicana is a deciduous Tree growing to 2 m (6ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers Seed SeedpodEdible Uses: Flowers - raw or cooked[105, 155, 161, 183, 257]. They can be used as a flavouring in cooked dishes[257]. The flowers can be boiled, then dried and stored for later use[257]. Seedpods - raw or cooked[229, 257]. They are gathered in the fall and eaten when fresh[229]. The pods can also be cooked then dried and stored for later use[257]. Seed - cooked[229, 257].

tcanta Fodder Soil stabilization WoodPlants succeed in dry barren sites, their suckering habit making them suitable for stabilizing banks[200, 229]. Wood - tough, elastic and durable[155, 257]. Used for fence posts etc[155].

dwatta Antirheumatic EmeticAntirheumatic[149, 216]. An emetic, it is used to clear the stomach[216, 257].

propta Seed - pre-soak for 48 hours in warm water and sow the seed in late winter in a cold frame[80]. A short stratification improves germination rates and time[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in the following summer. The seed stores for over 10 years[113]. Suckers taken during the dormant season.

nwatta Agroforestry Services: Nitrogen Fodder: Bank Industrial Crop: Biomass Management: Coppice Regional CropLandscape Uses:Specimen. Succeeds in a hot dry position. Succeeds in any soil, preferring one that is not too rich[1, 200]. Requires a well-drained soil, succeeding on dry barren sites[200]. Plants are tolerant of drought and atmospheric pollution[200]. The branches are brittle and very liable to wind damage[200]. When plants

are grown in rich soils they produce coarse and rank growth which is even more liable to wind damage[11, 200]. Plants can be coppiced[155]. Any pruning should be done in late summer in order to reduce the risk of bleeding[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features: North American native, Naturalizing, Attractive flowers or blooms.

### 5.1.43 Lathyrus palustris

Slenderstem Peavine, Marsh pea tfo2n 4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.2 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Lathyrus palustris is a PERENNIAL CLIMBER growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked[105, 161, 179]. The fully grown seeds are shelled and cooked as a vegetable[257]. Some caution is advised, see the notes above on toxicity. Young leaves and stems - cooked[177].

tcanta None known dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta A good plant for the bog or marsh garden, succeeding in wet soils[1, 200]. It is easily grown in any moderately good garden soil, preferring a position in full sun[200]. Plants climb by means of tendrils[188]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.44 Vicia cracca

Tufted Vetch, Bird vetch, Cow vetch tfo2n 4 tlin 8 cyuc 1 kcaak 3 tcan 1 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Vicia cracca is a PERENNIAL CLIMBER growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: TeaSeed - cooked[2, 22, 105]. They are boiled or roasted[183]. Leaves and young stems - cooked[105]. Used as a potherb[183]. The leaves are a tea substitute[183].

tcanta Green manureCan be used as a green manure[46]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta GalactogogueThe cooked plant is used as a galactogogue[218].

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in spring or autumn.

nwatta Succeeds in any well-drained soil in a sunny position if the soil is reliably moist throughout the growing season, otherwise it is best grown in semi-shade[200]. This

htut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Baptisia lactea is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Cathartic Emetic LaxativeCathartic, emetic, laxative[61].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed should be pre-soaked for 24 hours in warm water and then sown in a cold frame in late winter or early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer or following spring. Division in spring[188]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Prefers a deep, well-drained neutral to slightly acid soil in full sun[188, 200]. Grows freely in a loamy soil[1]. Plants are hardy to about -20°C[187]. Some modern works treat this species as a variety of *B. alba*, naming it *Baptisia alba macrophylla*. Somewhat shy flowering in British gardens[1]. Plants have a very deep root system and dislike root disturbance, they should be left alone once they are established[188, 233]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.56 Caragana gerardiana

tfo2n 4 tlin 8 cyuc 0 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Caragana gerardiana is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known

tcanta Hedge HedgePlants can be grown as a low impenetrable hedge. They are viciously spiny[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Prefers full sun and a light sandy dry or well-drained soil in a hot position[11, 182, 200]. Does not require a rich soil, succeeding on marginal land[11, 200]. Plants often do not flower well in British gardens, due in large degree to our lack of summer sun[182]. This species prefers a continental climate with hot summers and cold winters, it does not grow well in areas with mild damp winters[11, 200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.57 Desmodium paniculatum

Panicled tick trefoil tfo2n 4 tlin 10 cyuc 0 kcaak 3 tcan 0 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Desmodium paniculatum is an evergreen Perennial growing to 1 m (3ft 3in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta None Known

tcanta FodderCarbon Farming Solutions - Agroforestry Services: nitrogen, understorey legume. Fodder: bank, pasture (Agroforestry is a land use management system in which trees or shrubs are grown around or among crops or pasture-land). Attracts bees and attracts birds.

dwatta None Known

propta Seed germinates quickly (3-4 days) without scarification.

nwatta Agroforestry Services: Nitrogen Agroforestry Services: Understorey legume Fodder: Bank Fodder: Pasture Management: Fodder Wild CropClimate: cold to warm temperate. Humidity: semi-arid to humid. Prefers partial sun, mesic to dry-mesic conditions, and sandy or rocky soil. Light preferences: part-sun, part-shade. Low to medium water usage with a dry to moist soil. Soil type: acid and neutral and an average to poor loam, clay, or sand. Carbon Farming Solutions - Cultivation: wild. Management: fodder (Describes the non-destructive management systems that are used in cultivation) [1-1].

### 5.1.58 Lathyrus pratensis

Meadow Vetchling tfo2n 4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1.2 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Lathyrus pratensis is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcaakta None known

tcanta RepellentThe plant is said to repel mice.

dwatta ResolventThe seeds are used as a resolvent in Spain[240].

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta An easily grown plant, succeeding in any moderately good garden soil but preferring a position in full sun[200]. Succeeds on wet soils. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.59 Stylosanthes biflora

Sidebeak pencilflower tfo2n 4 tlin 8 cyuc 0 kcaak 2 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Stylosanthes biflora is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and

tcanta HedgeNitrogen fixer. Excellent flowers and foliage. Specimen or screen. Good plant for stabilizing embankments and slopes and for planting in poor, dry soils. Interesting informal hedge. Food and shelter for beneficials including shelter for lacewings and parasitoid wasps. Hummingbird nectar plant and bird shelter [1-2].

dwatta Native American Tribe: The Cherokee had several uses for the plant including: Root bark chewed as an emetic. Beaten root held on tooth for toothache. Infusion given to cows as a 'tonic' (brit.org).

propta Species are raised from seed. While cuttings will strike, the cultivars are usually grafted onto seedling stocks to ensure superior root systems.

nwatta A shrub or small tree which grows in dry woods and slopes. It has been reported to have occasionally escaped from cultivation. Grow in average, dry to medium moisture, well-drained soil in full sun. Prefers organically rich soils, but tolerates poor, dry soils. Flower: Showy. Bloom: Rosy pink to purplish-red. Bloom Time: May. Fruit: Showy. Tolerate: Deer, Drought, Erosion, Dry Soil, Shallow-Rocky Soil. As robinias have brittle branches that can be easily damaged by strong winds, it may be necessary to plant them in a protected spot. Otherwise, these are hardy, easily cultivated trees that will thrive in any bright position with moist well-drained soil. They can be pruned when young to establish a strongly branched structure. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.1.53 Colutea arborescens

Bladder Senna

tfo2n 4 tin 8 cyuc 0 kcak 4 tcan 2 dwat 3.6 m hkuc  
hmimhtut cyutli hgatyuctcup hwicli vyhshrasjltunyk hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Colutea arborescens is a deciduous Shrub growing to 3.6 m (11ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Hedge Hedge Soil stabilizationThe plants have an extensive root system and are used to stabilize banks and prevent soil erosion[200]. Can be grown as a hedge[200]. Nitrogen Fixer.

dwatta Diuretic Emetic PurgativeThe leaves are diuretic and purgative[4, 9]. The leaves are sometimes used as a substitute for senna as a laxative, though they are much milder in their action[4]. The plant is rather unreliable when used medicinally so is rarely employed in herbalism[9]. The seeds are emetic[4]. They are also toxic[9].

propta Seed - pre-soak for 24 hours in hot water and sow late winter in a greenhouse[113]. Scarification can help speed up the germination process[164]. Germination can be slow and erratic[200], though treated seed usually germinates in 1 - 3 months at 20°C[164]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings are not very long-lived[78].

nwatta An easily grown plant, it tolerates most soil conditions other than a water-logged soil[11]. Prefers a position in full sun but tolerates light shade[11]. Grows well on dry sunny banks[1, 182]. Dislikes strong winds, though another report in the same book says that it tolerates salt-laden

winds[200]. In our experience the plants are very subject to wind-rock when grown in a windy site[K]. Tolerates atmospheric pollution[182, 200]. A fast growing plant, thriving on poor soils[182, 200]. Plants are hardy to about -20°C[184, 200]. Slugs love the young seedlings[K]. Flowers are produced on the current season's growth[182, 200]. These flowers are very attractive to bees[108]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (20 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 5.1.54 Robinia fertilis

Bristly Locust

tfo2n 4 tin 8 cyuc 0 kcak 0 tcan 0 dwat 2 m hkuc  
htut cyutli hgatyuctcup hwicli vyhshrasjltunyk hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Robinia fertilis is a deciduous Shrub growing to 2 m (6ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta None known

tcanta Soil stabilizationPlants produce an extensive suckering root system and can be used for soil stabilization on banks etc.

dwatta None known

propta Seed - pre-soak for 48 hours in warm water and sow the seed in late winter in a cold frame[80]. A short stratification improves germination rates and time[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in the following summer. The seed remains viable for over 10 years in normal storage[113]. Suckers taken during the dormant season.

nwatta Succeeds in any soil, preferring one that is not too rich[1, 200]. Requires a well-drained soil, succeeding on dry barren sites[200]. Plants are tolerant of drought and atmospheric pollution[200]. The branches are brittle and very liable to wind damage[200]. When plants are grown in rich soils they produce coarse and rank growth which is even more liable to wind damage[11, 200]. Plants sucker freely, the suckers have vicious thorns. Any pruning should be done in late summer in order to reduce the risk of bleeding[200]. Hardy to at least -20°C. This species is very closely allied to *R. hispida* and scarcely merits specific rank. A very greedy tree, tending to impoverish the soil. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.55 Baptisia lactea

Wild Indigo

tfo2n 4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 2 m hkuc

species has occasionally been cultivated as a food plant, but yields are too low to make it very worthwhile[2]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.1.45 Lespedeza juncea

Chinese Lespedeza, Juncea lespedeza

tfo2n 4 tin 8 cyuc 1 kcak 0 tcan 1 dwat 1.2 m hkuc  
htut cyutli tcup hwicli hrasjltut hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Lespedeza juncea is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and shoots - cooked[179].

tcanta BroomThe twigs are used in making brooms[151].

dwatta Astringent DysenteryThe juice of the roots is used to treat diarrhoea and dysentery[272].

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[1]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the ground in all but very mild winters, though they generally resprout well from the base in the following spring and flower in late summer[182]. Related to *L. sericea*[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 5.1.46 Lespedeza capitata

Roundhead Lespedeza

tfo2n 4 tin 8 cyuc 1 kcak 3 tcan 2 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjltut hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Lespedeza capitata is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves have been boiled to make a tea[257].

tcanta Nitrogen Fixer.

dwatta Antidote Antirheumatic Cancer KidneyThe plant contains several biologically active compounds. Pharmaceutical preparations are manufactured from them[222]. An

extract of the plant is of disputed utility in chronic kidney diseases[222]. Experimentally, it has demonstrated antitumor activity against Walker-256 carcinosarcoma and is also reportedly effective in lowering blood cholesterol levels[222]. It is also believed to reduce blood levels of nitrogen compounds in persons with high nitrogen levels in their urine[222]. The root has been used as an antidote to poisoning[257]. The stems have been used in moxibustion in the treatment of neuralgia and rheumatism[222, 257].

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[1]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the ground in all but very mild winters, though they generally resprout well from the base in the following spring and flower in late summer[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

### 5.1.47 Baptisia tinctoria

Wild Indigo, Horseflyweed

tfo2n 4 tin 8 cyuc 1 kcak 2 tcan 3 dwat 0.9 m hkuc  
htut cyutli kyuctcup hwicli hrasjltut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Baptisia tinctoria is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from April to October, in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid or neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked. An asparagus substitute[2, 105, 161, 177]. Some caution is advised, see the notes above on toxicity.

tcanta Dye RepellentThis species is related to the tropical plant Indigo (*Indigofera tinctoria*) and, like that species, contains a blue dyestuff in the leaves[1]. The dyestuff is only contained in very low concentrations, however, and a very large quantity of leaves would be required to obtain reasonable quantities of indigo[169]. A yellow dye can also be obtained from the plant[61]. If the growing plant is harvested and hung up, it is said to repel flies[13].

dwatta Adaptogen Alterative Antibacterial Antiseptic Astringent Cholagogue Emetic Febrifuge Homeopathy Purgative StimulantWild indigo was a favourite medicine of the N. American Indians, a decoction of the roots being used as an antiseptic wash for wounds and skin complaints[213, 238]. Modern research has shown that this acrid bitter herb stimulates the immune system[222, 238] and is particularly effective against bacterial infections[238]. Caution is advised in the internal use of this plant, large or frequent doses are potentially harmful[222]. A tea made from the roots is cholagogue, emetic, febrifuge and purgative[4, 21, 46, 165, 222]. The fresh root is also considered to be antiseptic, astringent and laxative[4, 21, 46, 165, 222]. The infusion is used in the treatment of upper respiratory infections such as tonsillitis and pharyngitis, and is also valuable in treating infections of the chest, gastro-intestinal tract and skin[254]. The plants antimicrobial and immunostimulant properties combat lymphatic problems, when used with detoxifying herbs such as *Arctium lappa* it helps to reduce enlarged lymph nodes[254]. Wild indigo is frequently prescribed, along with *Echinacea*, in the treatment of chronic

viral infections or chronic fatigue syndrome[254]. A decoction of the root soothes sore or infected nipples and infected skin conditions[254]. When used as a mouth wash or gargle the decoction treats mouth ulcers, gum infections and sore throats[254]. The fresh root, including the bark, is used to make a homeopathic medicine[232]. This has a limited range of action, but is used especially in the treatment of certain types of flu[232].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed should be pre-soaked for 24 hours in warm water and then sown in a cold frame in late winter or early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in the summer or following spring. Division in spring[188]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Prefers a deep, rich, well-drained neutral to slightly acid soil in full sun[200, 233]. Grows freely in a loamy soil. Plants are shy flowering in British gardens[200, 233]. Plants have a very deep root system and dislike root disturbance, they should be left alone once they are established[188, 233]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.1.48 Genista tinctoria

Dyer's Greenweed, Common Woadwaxen, Broom  
tfo2n 4 tlin 7 cyuc 1 kcaak 3 tcan 2 dwat 0.6 m hkuc  
htut cyutli kyucupc hwcil hyishrasjlut hpa7tli flatprikliwis hpa7tmwattli fyifxre7t hjonli

drutta Genista tinctoria is a deciduous Shrub growing to 0.6 m (2ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Coffee CondimentThe seed has been suggested as a possible coffee substitute[177, 183]. The flower buds are pickled and used as a substitute for capers[2, 183]. Used as a vegetable[105].

tcanta Dye FibreA very good quality yellow dye is obtained from the whole plant, but especially from the flowers and young shoots[4, 9, 11, 57, 66, 141, 169, 244]. It produces a very good quality green when mixed with wood (Isatis tinctoria)[11, 238]. Alum, cream of tartar and sulphate of lime are used to fix the colour[4]. The stems can be dried and stored until the dye is required[169]. A fibre obtained from the stems is used for coarse cloth and cordage[4, 169]. Plants can be used as a ground cover when spaced about 45cm apart each way[208]. The cultivar 'Flore Pleno' is always dwarf and is more reliable than the species[208].

dwatta Cathartic Diaphoretic Diuretic Emetic Homeopathy Stimulant VasoconstrictorThe twigs, leaves and flowering stems are cathartic, diaphoretic, diuretic, emetic, stimulant and vasoconstrictor[4, 9, 21, 46]. The seeds are also sometimes used[4]. The plant is harvested in early summer as it comes into flower and can be dried for later use[9]. It should not be stored for more than 12 months since its active ingredients break down[238]. The powdered seeds act as a mild purgative and were at one time used to make a plaster for broken limbs[244]. A decoction of the whole plant has been

used as a remedy for dropsy, rheumatism and gout[4, 9, 244]. A homeopathic remedy is made from the fresh shoots[9]. It is used in the treatment of rheumatism[9].

propta The seed requires a period of cold stratification and is best sown autumn in a cold frame. Pre-soak stored seed for 24 hours in warm water and sow February in a cold frame. Good germination[78]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Cuttings of half-ripe wood, 5 - 10 cm with a heel, July/August in a frame. Roots are formed in the spring[11]. Cuttings of ripe wood, 5 - 10 cm with a heel, September/October in a frame. Good percentage. Plant out the following autumn[78].

nwatta Landscape Uses:Border, Container, Erosion control, Foundation, Massing, Specimen. Easily grown in a light well-drained soil in a sunny position[1, 11]. Prefers a rather dry soil, tolerating poor and sandy soils[238]. Prefers a lime-free soil[244]. Succeeds in acid or basic soils. A very cold-tolerant plant, tolerating temperatures down to about -35°C[200]. Resents root disturbance and should only be transplanted whilst young[11, 169]. Sometimes cultivated as a dye plant, but it is usually treated as a biennial for this purpose, the whole plant being harvested in the second year[141]. Plants do not require pruning, but they can be cut back as required once they have finished flowering in order to maintain shape[238]. Polymorphic, a number of named forms have been developed for their ornamental value[182]. A good bee plant[20]. Rabbits love eating this plant[169, K]. Cows also eat the plant, but it taints their milk[4]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2].

### 5.1.49 Alnus japonica

Japanese Alder  
tfo2n 4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 22 m hkuc  
hmimhtut cyutli kyucupc hpa7n hwcil hylisjlutnykifrip hpa7tli flatprikliwis hpa7tmwattli hjonli

drutta Alnus japonica is a deciduous Tree growing to 22 m (72ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from February to March. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta Charcoal Dye WoodA dye is obtained from the bark[46, 61]. No more details are given. Wood - close grained. Used for turnery, charcoal[46, 61].

dwatta CancerVarious species of alder, including this species, seem to contain antitumour compounds[218].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer,

otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Prefers a heavy soil and a damp situation, but it succeeds in ordinary garden soil[11]. Grows well in heavy clay soils[11]. Thrives in drier soils than many members of this genus[200]. Tolerates very infertile sites[200]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.1.50 Laburnum anagyroides

Laburnum, Golden chain tree  
tfo2n 4 tlin 8 cyuc 0 kcaak 4 tcan 1 dwat 6 m hkuc  
hmimhtut cyutli kyucupc hwcil hyishrasjlutnykifrip hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta Laburnum anagyroides is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Insecticide Rootstock WoodThis plant is often used as a rootstock for other members of the pea and bean family[11]. The seeds contain the poisonous alkaloid 'cytisine'. This has insecticidal properties similar to nicotine (Nicotiana spp.) but cannot be recommended for use since it needs to be used in such a concentration that it can then be absorbed over a wide area of the body with possibly fatal results[4]. Wood - coarse grained, durable, dark coloured and very hard, it can be used as an ebony substitute[4, 11, 46]. It is much in demand among turners, and is used in making instruments and furniture especially where strength and smoothness are important[4, 11, 46, 61].

dwatta PectoralThe seed contains the poisonous alkaloid 'cystisine'. This has been used in the treatment of whooping cough and asthma[4].

propta Seed - best sown as soon as it is ripe in a greenhouse or cold frame[200]. Germination is usually very quick and good[78]. Prick out indoor-sown seedlings into individual pots when they are large enough to handle and plant them out in the summer. Another option is to pre-soak the stored seed for 12 hours in warm water and sow in an outdoor seed bed in early spring. These plants can be allowed to grow on in the seedbed for two years before planting them out in the winter. Cuttings of mature wood in late winter planted in the open ground[200].

nwatta A very tolerant and easily grown plant, it succeeds in almost any soil or situation[1] so long as it is not water-logged[11]. It grows well in heavy clay soils. Succeeds in cold exposed situations and tolerates industrial pollution[200]. Plants can be successfully transplanted even when quite large[200]. The flowers are delicately scented[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. This species is notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations

help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.1.51 Laburnum alpinum

Scotch Laburnum, Alpine Bea Tree, Alpine Golden Chain Tree  
tfo2n 4 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 5 m hkuc  
hmimhtut cyutli kyucupc hwcil hyishrasjlutnykifrip hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta Laburnum alpinum is a deciduous Tree growing to 5 m (16ft) by 6 m (19ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Miscellany WoodWood - hard. It is highly esteemed by turners[7] and is used for making musical instruments[245].

dwatta Chologogue Miscellany PurgativeThe leaves are chologogue and purgative[7]. The leaves have a similar effect to tobacco and have thus been used in treating nicotineism[7]. The plant is very poisonous and should not be used internally without expert supervision[7].

propta Seed - best sown as soon as it is ripe in a greenhouse or cold frame[200]. Germination is usually very quick and good[78]. Prick out indoor-sown seedlings into individual pots when they are large enough to handle and plant them out in the summer. Another option is to pre-soak the stored seed for 12 hours in warm water and sow in an outdoor seed bed in early spring. These plants can be allowed to grow on in the seedbed for two years before planting them out in the winter. Cuttings of mature wood in late winter planted in the open ground[200].

nwatta Landscape Uses:Espalier, Specimen. A very tolerant and easily grown plant, it succeeds in almost any soil or situation[1] so long as it is not water-logged[11]. It grows well in heavy clay soils and in poor shallow limestone soils[245]. Succeeds in cold exposed situations and tolerates industrial pollution[200]. This species is closely related to *L. anagyroides*[11]. There are some named varieties, selected for their ornamental value[11]. The flowers have a delicious vanilla scent[245]. Plants can be successfully transplanted even when quite large[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. This species is notably susceptible to honey fungus[200]. Special Features:Not North American native, All or parts of this plant are poisonous, Blooms are very showy.

### 5.1.52 Robinia hispida

Bristly locust, Rose-acacia, or Moss locust  
tfo2n 4 tlin 8 cyuc 0 kcaak 3 tcan 1 dwat 3.5 m hkuc  
htut cyutli kyucupc hwcil hyishrasjlutnyk hpa7tli prikliwsslip hpa7tmwattli hjonli

drutta Robinia hispida is a deciduous Shrub growing to 3.5 m (11ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Birds, Insects. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None Known

is mixed with flour for making bread etc[K]. Seed - raw or cooked[63, 64, 105, 226, 257]. Rich in oil, the seed has a slightly resinous flavour. Quite small, it is only about 8mm long[200]. The seed can be crushed into a meal and used in making bread etc[213]. The resin has been chewed as a gum[226, 257]. Young male cones have been chewed for the juice[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Basketry Cosmetic Dye Fuel Gum Herbicide Insulation Resin Shelterbelt Strewing Tinder WoodA tan or green dye is obtained from the needles[168]. A yellow dye can be made from the pollen[226]. A blue dye can be made from the roots[257]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. The branches are used as a strewing herb[99]. A decoction of the plant tops has been used as a conditioning wash to give a person a fair and smooth skin[257]. A fairly wind-tolerant tree, it can be used in shelterbelt plantings[200]. This tree is a source of resin, though it is not exploited commercially[64, 171]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative, adhesive etc[257]. It burns well and so has been used to make torches[257]. The root fibres have been used in making baskets[257]. Material for insulation and a tinder are also obtained from the tree[99]. The cones make a quick fire, whilst the scales from the trunk bark burn easily, give off no smoke and cool quickly[213]. Wood - light, strong, fine-grained and pleasantly aromatic, the wood can vary from soft to hard[1, 46, 82, 171, 226, 229]. An important lumber tree, it is used for making furniture, boxes, toys etc[1, 46, 82, 171, 226, 229], and it is also used for fuel[99]. For reasons that are unclear, some tree stumps contain high concentrations of pitch - this makes them very rot-resistant and inflammable and therefore useful for fence posts and kindling[226].

dwatta Antiseptic Diuretic Febrifuge Ophthalmic Pectoral Poultice Rubefacient Salve Skin Vermifuge Vulnery-Ponderosa pine was employed medicinally by several native North American Indian tribes, who valued it especially for its antiseptic and vulnerary properties, using it to treat a range of skin problems, cuts, wounds, burns etc[257]. It was also valued for its beneficial effect upon the respiratory system and was used to treat various chest and lung complaints[257]. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. The branches are used in herbal steam baths as a treatment for muscular pains[257]. A decoction of the plant tops has been used in the treatment of internal bleeding and high fevers[257]. An infusion of the dried buds has been used as an eye wash[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long

as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional TimberThrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Seedlings strongly dislike growing in the shade[60] and are unable to succeed under the canopy of the parent trees[226]. Plants are fairly wind tolerant[200]. Extensively used in cool temperate forestry[200], this species is occasionally planted for timber in central and southern Europe[50]. Growth can be quite fast when young but it soon drops of and averages around 30cm per year[185]. The best trees in Britain are found in a belt running from Kent through the Midlands to N. Wales and also in S. Scotland[185]. Trees live 300 - 600 years in the wild[229], they seem to be long-lived and healthy in Britain[185]. Seed production commences when the tree is about 20 years old[229]. There are usually several years of low to medium yields between each year of high yields[229]. The cones are 8 - 15cm long, they open and shed their seed whilst still attached to the tree and then soon fall from the tree[82, 226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.150 *Tilia tomentosa*

Silver Lime

4 tlin 7 cyuc 3 kcak 2 tcan 1 dwat 25 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

drutta *Tilia tomentosa* is a deciduous Tree growing to 25 m (82ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaYoung leaves - raw or cooked[179]. The dried leaves are sometimes used as an adulterant for marjoram (*Origanum majorana*)[183]. A tea can be made from the flowers. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta FibreA fibre is obtained from the tough inner bark It can be made into diverse items such as mats, shoes and coarse cloth[229].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78].

(sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark SeedEdible Uses: CondimentSeed - raw or cooked[226]. They can also be ground into a powder and then used as a flavouring in soups etc or can be added to cereal flours when making bread, biscuits, cakes etc[226]. Large and sweetly-flavoured, the oil-rich seed is up to 9 x 7mm[200] and has a thick shell[82]. It has a pleasant slightly resinous flavour[K]. Eating the raw seeds in quantity can cause constipation[257]. Inner bark[161, 177, 257]. There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - soft, light, coarse grained, brittle[82]. Used occasionally for fuel[229].

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Specimen. Thrives in a light well-drained sandy or gravelly loam in a sunny position[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Plants often colonise exposed mountain slopes in the wild, their root system anchoring them firmly[226]. A long-lived but slow-growing tree in the wild[229]. It grows well in Britain[81], coning regularly at Kew[11], but not doing so well in the milder parts of the country[120]. It is best suited for growing in northern areas at higher elevations[120]. Trees do not produce large numbers of cones but small numbers are formed annually[229]. The cones are up to 8cm long, they ripen in late summer

and do not open on the tree but fall intact to the ground[81, 82, 200, 226]. This species is the only N. American pine within this habit and it is thus considered to be a primitive species[226]. The seed is extracted by breaking up the soft scales of the cone[200]. Birds and mammals often open the cones and eat the seeds before they mature[1]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species is closely related to *P. flexilis*[11], differing mainly in the cones[226]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.43 *Hemerocallis multiflora*

4 tlin 8 cyuc 4 kcak 0 tcan 1 dwat m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjltunykrip hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

drutta *Hemerocallis multiflora* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked[205]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked. Relatively small for a day lily, but the flowers are crisp with a pleasant sweetness and no aftertaste - they make a delicious addition to salads[K]. The flowers can also be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked[K]. We have found them to be tender but fairly bland with a slight sweetness[K]. The roots are slightly fleshy, with a swollen, tuberous part near the tip[266]. The swollen roots are quite small and are only really worthwhile using if the plant is being dug up for divisions or some other reason[K].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[11] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. This species is closely related to *H. micrantha* and *H. plicata*[205]. Individual flowers are short-lived but the plant produces a succession of blooms. Each scape carries between 75 and 100 blooms[205]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The

plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

### 5.2.44 Allium canadense

Canadian Garlic, Meadow garlic, Fraser meadow garlic, Hyacinth meadow garlic  
4 tlin 8 cyuc 4 kcaak 2 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tucphja7n hwicli hrasljut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Allium canadense is a BULB growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[46, 61, 62, 177]. It can be used as a vegetable, or as a flavouring in soups and stews, and can also be pickled[2]. The bulb is up to 30mm in diameter, it is crisp, mild and with a pleasant flavour[183]. Used as a leek substitute according to one report[22], it is a garlic substitute according to others[55, 159, K]. Leaves - raw or cooked[55, 62, 177]. A delicious mild flavour, they are available from early spring until the autumn[K]. They make a very acceptable salad and can also be used as a greens or as a flavouring in cooked foods[K]. Flowers - raw. A little bit stronger flavour than the leaves, especially as the seeds begin to form, they can be used as a flavouring and garnish on salads[K]. Some forms of this species produce bulbils. These top-setting bulbils make a fine onion flavoured pickle[62, 105, 183]. They are said to have a superior flavour to other pickled onions[2].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20]. The plant can be rubbed on exposed parts of the body to protect them from insect bites and the bites of scorpions, lizards etc[257].

dwatta Antiasthmatic Carminative Cathartic Diuretic Expectorant StimulantThe plant is antiasthmatic, carminative, cathartic, diuretic, expectorant and stimulant[257]. A tincture is used to prevent worms and colic in children, and also as a remedy for croup[257]. Although no other specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required. Bulbils planted in situ when ripe.

nwatta Prefers a sunny position in a light well-drained soil[1]. A moisture loving plant according to another report[42]. The bulbs should be planted fairly deeply[1]. Bulbs grow to a good size under cultivation[183]. Some forms of this species produce many bulbils and are considered to be a pernicious weed in some areas of America[159], there is some risk that they could spread aggressively in Britain[203]. A. canadense mobilense. (Reg.)F.M.Ownb. is a form that does not produce bulbils and is much better behaved[200]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if

available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 5.2.45 Berberis buxifolia

Magellan Barberry  
4 tlin 8 cyuc 4 kcaak 3 tcan 2 dwat 2.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasljutnykifrip hpa7tli flatprikwis hpa7tmwatli yfifxre7t hjonli

drutta Berberis buxifolia is an evergreen Shrub growing to 2.5 m (8ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or used in conserves[3, 11, 69, 139, 177]. Freely borne in Britain. Large and black with a pleasant flavour, they are eaten out of hand[183]. Said to be the best flavoured of the South American barberries, the fruit is hardly acid and but slightly astringent[2]. The green unripe fruits can be used like gooseberries in pies etc[2, 183]. The fruits are about 8mm long[200].

tcanta Dye Hedge HedgeA yellow dye is obtained from the root[139]. The dwarf form, var. 'Nana' makes a good dwarf hedge to 1 metre tall[182].

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Roots in 4 - 8 weeks[113]. Pot up in spring[113]. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils and in full sun[11, 200]. Grows well in heavy clay soils. Plants are hardy to about -15°C[184], but they can be deciduous in cold winters[188]. The dwarf B. buxifolia nana is the form of this species that is most commonly found growing in Britain. It is very free flowering but to date (1994) we have not seen this form bearing fruit[K]. The species is supposed to be self-fertile so it is possible that this form is sterile. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely and re-sprout well from the base[200].

### 5.2.46 Hemerocallis fulva longituba

4 tlin 8 cyuc 4 kcaak 2 tcan 1 dwat 1 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasljutnykifrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis fulva longituba is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline)

or mixed with cereals when making bread[161]. Self-sown seedlings, gathered in early spring, are eaten fresh or dried for later use[213]. Seeds - cooked. The wings are removed and the seeds boiled then eaten hot[213]. The seed is very small, about 5mm long, and is produced in small clusters[K].

tcanta Basketry Companion Dye Pioneer Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. The dried inner bark yields a purple colour[4, 57, 82]. Mixed with lead sulphate this produces a black dye which can also be used as an ink[4]. The dye is dark blue according to another report[95]. The wood is used to make basket splints[257]. This species can successfully establish itself in recently cleared areas and partially open woodlands[229]. It can therefore be used as a pioneer species to speed the regeneration of woodland[K]. Wood - not strong, close grained, hard, very heavy[46, 82, 227]. It weighs 38lb per cubic foot[227]. The grain of some old specimens is undulated, this gives beautiful effects of light and shade on polished surfaces[4]. The wood is commonly used for making furniture, turnery, pulp, etc[46, 82, 227].

dwatta Antispasmodic Astringent Dysentery OphthalmicThe bark has astringent properties and has been used as an application for sore eyes[4]. The inner bark was used according to one report[257]. An infusion of the bark has been used to treat cramps and dysentery[257].

propta Seed - best sown as soon as it is ripe in the spring in a cold frame. It usually germinates immediately and by the end of summer has formed a small tree with several pairs of leaves[82]. Stored seed quickly loses its viability. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Firewood, Aggressive surface roots possible, Specimen, Street tree, Woodland garden. Of easy cultivation, it prefers a good moist well-drained soil[11, 98], though this species succeeds in wetter soils than most other members of the genus. Grows well in heavy clay soils. Dislikes chalk according to one report[98], whilst others say that it does less well on chalk[200], often becoming chlorotic as a result of iron deficiency. Prefers a sunny position but tolerates some shade. Tolerates atmospheric pollution[200]. A fast-growing tree for the first 20 - 30 years of its life, it may live for 75 - 100 years[229]. Red maple is a bad companion plant, inhibiting the growth of nearby plants[18, 20]. A variable species with several sub-species[227], there are also many named varieties that have been selected for their ornamental value[200]. This species is often confused with A. saccharinum[11]. Special Features:Attracts birds, North American native, Naturalizing, Wetlands plant, Attractive flowers or blooms.

### 5.2.148 Tilia heterophylla

White Basswood, American basswood  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 30 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnykifrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Tilia heterophylla is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw. A nice mild flavour with a slightly mucilaginous texture[K]. They go well in a mixed salad, though I have found that on their own they tend to leave a slightly rough feeling

in the throat[K]. The dried flowers make a refreshing tea substitute[159]. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta Fibre WoodA fibre is obtained from the tough inner bark It can be made into diverse items such as rope, mats, shoes and coarse cloth[229, 257]. Wood - soft, light, weak, straight grained[229, 235]. It weighs 26lb per cubic foot[235]. Widely used in interior finishing, cabinet making, woodenware, paper making and for piano keyboards[229].

dwatta Antispasmodic Diaphoretic Dysentery Poultice SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226]. A decoction of the inner bark has been used in the treatment of dysentery[257]. A decoction of the bark, mixed with corneal, has been used as a poultice in the treatment of boils[257]. A decoction of the inner bark and twigs has been used during pregnancy to treat heartburn, weak stomach and weak bowels[257].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. A moderately fast growing and long-lived species in the wild[229]. It prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. It is fairly susceptible to forest fires because it has a thin bark[229]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of shade[200]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Closely related to T. americana[11]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.149 Pinus ponderosa

Ponderosa Pine, Washoe pine  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 25 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus ponderosa is an evergreen Tree growing to 25 m (82ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark SeedEdible Uses: Condiment GumInner bark - raw or cooked[257]. Mucilaginous[105, 161, 213]. Best harvested in the spring[257]. The inner bark can be eaten fresh, but is more often dried, ground into a powder and either used as a thickener in soups or



and tonic[7, 21]. They have been used in the treatment of rheumatism, neuralgia and haemorrhoids[4]. They are said to be narcotic and that 10 grains of the nut are equal to 3 grains of opium[213]. An oil extracted from the seeds has been used externally as a treatment for rheumatism[254]. A compound of the powdered roots is analgesic and has been used to treat chest pains[257]. The buds are used in Bach flower remedies - the keywords for prescribing it are 'Failure to learn by experience', 'Lack of observation in the lessons of life' and hence 'The need of repetition'[209]. The flowers are used in Bach flower remedies - the keywords for prescribing it are 'Persistent unwanted thoughts' and 'Mental arguments and conversations'[209]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Aesculus hippocastanum* for chronic venous insufficiency in the legs (see [302] for critics of commission E).

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Landscape Uses:Firewood, Pollard, Specimen, Street tree. Prefers a deep loamy well-drained soil but is not too fussy tolerating poorer drier soils[11, 200]. Tolerates exposed positions and atmospheric pollution[200]. A very ornamental and fast-growing tree[1, 4], it succeeds in most areas of Britain but grows best in eastern and south-eastern England[200]. Trees are very hardy when dormant, but the young growth in spring can be damaged by late frosts. The flowers have a delicate honey-like perfume[245]. Trees are tolerant of drastic cutting back and can be severely lopped[200]. They are prone to suddenly losing old heavy branches[98]. The tree comes into bearing within 20 years from seed[98]. Most members of this genus transplant easily, even when fairly large[11]. Special Features: Attractive foliage, Not North American native, Naturalizing, Blooms are very showy.

## 5.2.146 *Carya tomentosa*

Mockernut, White Heart Hickory, Mockernut Hickory  
4 tin 9 cyuc 3 kcaak 0 tcan 1 dwat 30 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik-  
lwis hpa7tmwatli fyif hjonli

drutta *Carya tomentosa* is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to November, in flower in June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Sap SeedEdible Uses: Seed - raw or cooked[1, 43, 101, 159]. A delicious sweet taste but the thick, hard shell makes extraction very difficult[2, 183, 226]. The kernel is quite small considering the size of the nut[226]. Even squirrels leave the seed to accumulate under trees[117, 183]. The seed can be up to 6cm long[229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. Sap - used as a drink. Tapped in spring, it has a sweet flavour[101].

tcanta Dye Fuel Repellent WoodA black dye is obtained by boiling the bark in a vinegar solution[229]. A beige dye is extracted from the leaves and twigs, cream of tartar is required as a mordant[226]. A yellow dye is obtained from the bark when alum is used as a mordant[226]. The inner bark has been used to finish baskets and to make chair bottoms[257]. The leaves have been scattered about to repel insects[257]. Wood - close-grained, tough, elastic, very heavy, hard[61, 82, 227, 229]. It weighs 51lb per cubic foot[227]. The wood has excellent bending qualities and can withstand compression better than most other woods[229]. One of the best hickory woods, it is an important commercial timber and

is used for vehicle parts, tool handles, fuel etc[61, 63, 82, 227, 229].

dwatta Astringent DetergentThe inner bark is astringent and detergent[257]. It has been used as a dressing for cuts and has also been chewed to treat sore mouths[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Landscape Uses:Aggressive surface roots possible. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Succeeds in poor soils[63] and in drier soils than many other members of the genus[200]. Generally a slow growing tree[200] though it is fast when young[149]. Trees respond well to coppicing[149]. A very ornamental and long-lived tree[1, 227], it is quite successful in Britain[137] and has been planted on an experimental scale for its timber in Germany[50]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees in the wild commence fruiting when about 20 years old, with an optimum seed bearing age from 40 - 150 years, though they often live for 300 - 500 years[229]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June)[137], but lose their leaves later in the autumn than other *Carya* species[229]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Attractive flowers or blooms.

## 5.2.147 *Acer rubrum*

Red Maple, Drummond's maple, Swamp Maple  
4 tin 10 cyuc 3 kcaak 3 tcan 1 dwat 30 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Acer rubrum* is a deciduous Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from March to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner bark Leaves Sap SeedEdibl Uses: SweetenerThe sap contains sugar and this can be used as a drink or be concentrated into a syrup by boiling off the water[2, 11, 74, 159]. The syrup is used as a sweetener on many foods. This species only yields about half the quantity obtained from the sugar maple (*A. saccharum*)[4]. It makes a good maple syrup although the yield is comparatively small[183]. It can be harvested in late winter, the flow is best on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. Inner bark - cooked[105, 177]. It is dried, ground into a powder and then used as a thickening in soups etc

soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked[105, 116]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177]. They can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked[205]. A pleasant nutty flavour.

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[200] but tolerating partial shade. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. Unlike the type species, this form does produce viable seed[187]. Plants take a year or two to become established after being moved[200]. Individual flowers are short-lived, opening in the morning and withering in the evening. The plant, however, produces a succession of flowers over a period of about 6 weeks[205]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

## 5.2.47 *Ribes divaricatum*

Coastal Black Gooseberry, Spreading gooseberry, Parish's gooseberry, Straggly gooseberry

4 tin 8 cyuc 4 kcaak 2 tcan 1 dwat 2.7 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
lwis hpa7tmwatli xre7t hjonli

drutta *Ribes divaricatum* is a deciduous Shrub growing to 2.7 m (8ft 10in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[2, 3, 61, 118, 257]. Sweet and juicy[183]. A very acceptable flavour, though a bit on the acid side[K]. It is considered to be one of the finest wild N. American gooseberries[183]. The fruit is sometimes harvested before it is fully ripe and then cooked[256]. The fruit is about 10mm in diameter[200]. On the wild species the fruit can hang on the plant until the autumn (if the birds leave it alone)[K]. Young leaves and unripe fruits are used to make a sauce[183].

tcanta Miscellany Needles StringThe roots have been boiled with cedar (*Juniperus* spp. Thuja sp.) and wild rose (*Rosa* spp) roots, then pounded and woven into rope[257]. The sharp thorns have been used as probes for boils, for removing splinters and for tattooing[257].

dwatta Miscellany TB VDTThe inner bark has been chewed, and the juice swallowed, as a treatment for colds and sore throats[257]. A decoction of the bark or the root has been used as an eye wash for sore eyes[257]. An infusion of the roots has been used in the treatment of sore throats, venereal disease and tuberculosis[257]. The burnt stems have been rubbed on neck sores[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Requires a very sunny position if it is to do well[11]. Plants are hardy to about -20°C[200]. This species is closely allied to *R. rotundifolium*[11]. Immune to mildew[101], this species is a parent of many mildew resistant hybrids and is being used in breeding programmes in Europe[200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Sometimes cultivated for its edible fruit, there is at least one named variety[183]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 5.2.48 *Hemerocallis dumortieri*

Dumortier's daylily  
4 tin 8 cyuc 4 kcaak 3 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyikfrip hpa7tli flat-  
priklwis hpa7tmwatli xre7t hjonli

drutta *Hemerocallis dumortieri* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves ShootsEdible Uses: Leaves and young shoots - cooked[105, 177, 183]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177, 205]. The flowers are crisp and juicy with a pleasant sweetness and no unpleasant after-taste[K]. They can be dried and used as a thickener in soups etc[183]. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked.

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Plants form a slowly spreading clump and are suitable for ground cover when spaced about 45cm apart each way[208]. The dead leaves should be left on the ground in the winter to ensure effective cover[208].

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil[200]. Grows well in heavy clay soils. Succeeding in sun or shade, it produces more flowers in a sunny position though these flowers can be shorter-lived in very sunny positions[205]. Succeeds in short grass if the

soil is moist[1]. Prefers a pH between 6 and 7[200]. This species is hardy to about -20°c[187]. Hybridizes freely with other members of this genus[200]. Individual flowers only live for one day[205]. The flowers are sweetly scented[245]. Plants form a tight clump that spreads slowly[K]. The roots are cylindrical[205]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

## 5.2.49 Cryptotaenia japonica

Mitsuba, Japanese honewort

4 tin 8 cyuc 4 kcaak 0 tcan 1 dwat 1 m hkuc pcmhmitut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta *Cryptotaenia japonica* is an evergreen Perennial growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kckakta Edible Parts: Leaves Root StemEdible Uses: CondimentLeaves and stems - raw or cooked[2, 52, 116]. Used as a flavouring with a parsley-like flavour if you let your imagination run away with you[K]. Seedlings and young leaves can be used in salads[206]. When cooking, the leaves should not be cooked for more than a couple of minutes or the flavour is destroyed[206]. The leaves contain about 2.3% protein, 0.23% fat, 4.4% carbohydrate, 2.1% ash[179]. Root - raw or cooked[2, 52, 116, 183]. Blanched stem - a celery substitute[2, 116]. The seed is used as a seasoning.

tcanta None known

dwatta Febrifuge Tonic Women's complaintsWomen's complaints. Used in the treatment of haemorrhages, colds, fevers etc[178]. Used as a tonic for strengthening the body[266].

propta Seed - sow April in a greenhouse. Germination is usually rapid, prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. The ideal temperature for sowing is about 25°c, though seed does germinate at higher and lower temperatures[206]. Seed can also be sown in early autumn[206]. Division in spring or autumn.

nwatta Succeeds in most soils, preferring a moist shady position under trees where it often self-sows[52]. The leaves tend to turn yellow when plants are grown in full sun[206]. This species is not winter-hardy in all areas of Britain, though plants can tolerate short periods at temperatures down to -10°c[206]. Mitsuba is commonly cultivated as a vegetable in Japan, there are some named varieties[183]. It is usually grown as an annual[206]. It is closely allied to *C. canadensis*, and is considered to be no more than a synonym of that species by some botanists[200]. This plant is adored by slugs and snails and must be protected when small or when new growth is emerging in the spring[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.50 Castanea species

Chestnut Hybrids

4 tin 9 cyuc 4 kcaak 4 tcan 2 dwat 30 m hkuc hmimhtut cyutli hgtaktyucup hwicli hyishrasjltutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Castanea species* is a deciduous Tree growing to 30 m (98ft) by 25 m (82ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in October. The species is monoecious

(individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kckakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[183]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K]. The seed is low in fats and oils but high in carbohydrates[183]. Carbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

tcanta The bark, leaves, wood and seed husks all contain tannin. Wood - hard, strong, light. Carbon Farming Solutions - Industrial Crop: biomass, tannin (Crops growing for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Other Systems: woody agriculture.

dwatta Some see for example the individual entries for *Castanea dentata*, *Castanea mollissima*, *Castanea pumila* propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K]. These plants are of hybrid origin, so seed is unlikely to breed true[K].

nwatta Industrial Crop: Biomass Agricultural Crop: Tannin Management: Coppice Management: Standard New Crop Other Systems: Woody agriculture Staple Crop: Balanced carbClimate: cold to warm temperate. Humidity: humid. This record includes a number of garden hybrids involving various species - the origin of each hybrid will be mentioned in the individual cultivar notes. To date, these different hybrids have not been assigned their own specific name. The following notes are based on the general needs of the genus. Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Carbon Farming Solutions - Cultivation: new crop. Management: standard, coppice (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.51 Aesculus flava

Sweet Buckeye, Yellow buckeye

4 tin 8 cyuc 4 kcaak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Aesculus flava* is a deciduous Tree growing to 20 m (65ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. This species is closely related to *T. cordata*[200]. It is also closely related to *Tilia japonica*, differing in having smaller leaves and bracts, and shorter cyme[266]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.144 Juglans intermedia

Hind's Black Walnut, Northern California walnut, Paradox hybrid walnuH

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 30 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyf hjonli

drutta *Juglans intermedia* is a deciduous Tree growing to 30 m (98ft 5in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw[183]. An edible oil is obtained from the seed, it tends to go rancid quickly.

tcanta Herbicide OilPlants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus species*), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200].

dwatta None known

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such as the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80]. This species is a natural hybrid and may not breed true from seed.

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°c, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus species*), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves

of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. A hybrid, *J. nigra* x *J. regia*, sometimes cultivated for its edible seed, there are some named varieties[183].

## 5.2.145 Aesculus hippocastanum

Horse Chestnut, European Horsechestnut, Common Horsechestnut

4 tin 7 cyuc 3 kcaak 3 tcan 4 dwat 30 m hkuc hmimhtut cyutli kyucutcup hwicli hyishrasjltutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Aesculus hippocastanum* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kckakta Edible Parts: SeedEdible Uses: CoffeeThe roasted seed is used as a coffee substitute[2, 7]. Seed - cooked. It can be dried, ground into a powder and used as a gruel[7, 46, 55, 61]. The seed is quite large, about 3cm in diameter, and is easily harvested. It is usually produced in abundance in Britain. Unfortunately the seed is also rich in saponins, these must be removed before it can be used as a food and this process also removes many of the minerals and vitamins, leaving behind mainly starch. See also the notes above on toxicity. The seed contains up to 40% water, 8 - 11% protein and 8 - 26% toxic saponins[218]. The following notes apply to *A. californica*, but are probably also relevant here: The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in this for 2 - 5 days[213].

tcanta Dye Soap Starch Tannin WoodSaponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. The seed contains variable amounts of saponins, up to a maximum of 10%[240]. A starch obtained from the seed is used in laundering[100]. The bark and other parts of the plant contain tannin, but the quantities are not given[223]. A yellow dye is obtained from the bark[4]. The flowers contain the dyestuff quercetin[223]. Wood - soft, light, not durable. Of little commercial value, it is used for furniture, boxes, charcoal[2, 11, 46, 61].

dwatta Alterative Analgesic Antiinflammatory Antirheumatic Astringent Bach Diuretic Dysentery Expectoant Febrifuge Haemostatic Malaria Narcotic Tonic Vasoconstrictor VulneraryHorse chestnut is an astringent, anti-inflammatory herb that helps to tone the vein walls which, when slack or distended, may become varicose, haemorrhoidal or otherwise problematic[254]. The plant also reduces fluid retention by increasing the permeability of the capillaries and allowing the re-absorption of excess fluid back into the circulatory system[254]. This plant is potentially toxic if ingested and should not be used internally without professional supervision[254]. Alterative, analgesic, haemostatic and vulnerary[165, 218]. The bark is anti-inflammatory, astringent, diuretic, febrifuge, narcotic, tonic and vasoconstrictive[4, 7, 222]. It is harvested in the spring and dried for later use[4]. The plant is taken in small doses internally for the treatment of a wide range of venous diseases, including hardening of the arteries, varicose veins, phlebitis, leg ulcers, haemorrhoids and frostbite[238, 254]. It is also made into a lotion or gel for external application[254]. A tea made from the bark is used in the treatment of malaria and dysentery, externally in the treatment of lupus and skin ulcers[4, 222]. A tea made from the leaves is tonic and is used in the treatment of fevers and whooping cough[222, 240, 254]. The pericarp is peripherally vasoconstrictive[7]. The seeds are decongestant, expectoant

## 5.2.142 *Carya ovata*

Shagbark Hickory

4 tin 8 cyuc 3 kcaak 4 tcan 1 dwat 30 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli fyif hjonli

drutta *Carya ovata* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to October, in flower in June, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Sap SeedEdible Uses: MilkSeed - raw or cooked and used in pies, cakes, bread etc[2, 4, 61, 62, 183]. Sweet and delicious[1, 117, 183]. The seed can be ground into a meal and used to thicken soups etc[183]. A nut milk can be prepared from the seed and this is used as a butter on bread, vegetables etc[183]. The shell is normally thick and hard[101] but in selected cultivars it can be thin[159]. The seed ripens in late autumn and can be stored for up to 2 years in a cool cellar[117]. The seed is up to 4cm long[229]. Sap - sweet[257]. It is tapped in spring[101] and can be made into a syrup[226].

tcanta Dye Fuel WoodA yellow dye is obtained from the inner bark[226]. Wood - close-grained, tough, elastic, heavy and very hard. It weighs 52lb per cubic foot[227]. An excellent quality wood, it is used for tool handles, wheel spokes, sporting goods, baskets etc[46, 61, 63, 82, 227, 229]. The wood is an excellent fuel, burning well and giving off a lot of heat[229]. It produces an excellent charcoal[229]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Analgesic AntirheumaticThe fresh small shoots have been steamed to make an inhalant for treating headaches[257]. A decoction of the bark has been taken internally to treat rheumatism and also used as a poultice on rheumatic joints[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Management: Standard Regional Crop Staple Crop: OilLandscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible, Specimen. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Succeeds in drier soils than most members of this genus[200]. Slow growing[200]. A very ornamental but slow-growing tree[1, 11, 227], it grows well in Britain, especially when young[11, 137], and does well in Cornwall[59]. The tree has a loose grey bark that comes away in broad flakes and gives the tree its common name[11]. The shagbark hickory is occasionally cultivated for its edible seed, there are some named varieties[183]. It tends to be low-yielding[117] and is said to be of no value in Britain as a commercial nut crop[11]. Trees take 15 years to come into flower from seed[117]. This species is the fastest growing hickory in N. America, it can fruit in ten years from seed[137]. Recommended cultivars (these are often hybrids with *C. cathayensis* or *C. laciniosa*) include: Shagbarks - 'J Yoder No. 1', heavy cropping and early[200]. 'Porter'. 'Weschcke', a very thin shell and regular cropper[200]. 'Wilcox', an excellent producer[200]. Shellbarks (these are more likely to be hybrids with *C. laciniosa*) - 'Fayette', thin shelled[200].

'Henry', a very large nut[200]. Cultivated as a timber tree in C. Europe[50]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. The leaves are aromatic[245]. Special Features:North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.143 *Tilia amurensis*

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 30 m hkuc  
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta *Tilia amurensis* is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw[K]. A famine food, it is only used when all else fails[177]. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta FibreThe fibrous inner bark is used for making sandals etc[151].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

kcakta Edible Parts: Nectar SeedEdible Uses: Seed - cooked. Said to be as sweet as a chestnut[105, 177]. We have only eaten the immature seed, harvested in late August, but these were very tasty with no noticeable bitterness[K]. The seed can be up to 45mm in diameter and is easily harvested[82]. It can be dried, ground into a flour and used as a gruel. The seed contains saponins and needs to be leached of these toxins before it becomes safe to eat - the North American Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213, 229]. The resulting product is said to be tasty and nutritious[229], though most of the minerals etc would have been leached out[K]. The flowers contain a sweet nectar which is delicious when sucked out[245].

tcanta Soap WoodSaponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Wood - very soft, light, close grained, difficult to split. It weighs 27lb per cubic foot[235]. It is used for making artificial limbs, wooden ware, pulp etc, and is occasionally sawn into lumber[46, 62, 82, 171].

dwatta None known

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Landscape Uses:Pest tolerant, Pollard, Specimen. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. Grows best in eastern and south-eastern areas of England probably needing a continental climate in order to thrive[126, 200]. Although the trees are very hardy when dormant, the new growth can be damaged by late spring frosts[11]. Plants grow well in a woodland situation, tolerating shading by larger trees[229]. Seedlings grow away quickly, the plants reaching maturity when about 60 - 80 years old[229]. The form *Asculus flava vestita* (Sarg.) Fern. is growing well at Kew Gardens. It has been seen with large crops of fruit on a number of occasions, even in cooler summers. These fruits have only been tried when immature (harvested at the end of August) but were then very tasty with no bitterness[K]. Fruits are produced more abundantly in warm summers[130]. Most members of this genus transplant easily, even when fairly large[11]. Special Features:Attractive foliage, North American native, Blooms are very showy.

## 5.2.52 *Hordeum vulgare*

Barley, Common barley

4 tin 8 cyuc 4 kcaak 0 tcan 3 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta *Hordeum vulgare* is a ANNUAL growing to 1 m (3ft 3in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Coffee Drink Salt SweetenerSeed - cooked as a whole grain or ground up and used as a flour for making bread, porridges etc[2, 7, 46, 183]. It has a low gluten content and so is unsuitable for making wheat-type breads[238, K]. The seed can be fermented into sourdough and many other fermented foods such as 'tempeh' and 'miso'[183]. The seed can also be sprouted and added to salads or the sprouted seed juiced and the juice drunk as a health-food drink[183]. The decorticated seed is called pearl barley. This is no longer viable

since the decortication process damages the embryo. It is used in soups, stews etc[238]. Malt is obtained by sprouting the whole seed and then roasting it. The seed is then ground into a flour and boiled in water. The resulting liquid is very sweet and can be used in making beer or other drinks, and as a nutritious sweetener in various foods.[7, 46]. The roasted (unsprouted) seed is used as a coffee[46, 183] and a salt substitute.

tcanta Biomass Mulch PaperThe stems, after the seed has been harvested, have many uses. They are a source of fibres for making paper, a biomass for fuel etc, they can be shredded and used as a mulch[141, 171].

dwatta Abortifacient Cancer Carminative Demulcent Digestive Diuretic Emollient Expectorant Febrifuge Galactofuge Hypoglycaemic Lenitive Nutritive Poulitice StomachicThe shoots are diuretic[218]. The seed sprouts are demulcent, expectorant, galactofuge, lenitive and stomachic[176, 218]. They are sometimes abortifacient[218]. They are used in the treatment of dyspepsia caused by cereals, infantile lacto-dyspepsia, regurgitation of milk and breast distension[176]. They are best not given to a nursing mother since this can reduce milk flow[176]. The seed is digestive, emollient, nutritive, febrifuge and stomachic[218]. It is taken internally as a nutritious food or as barley water (an infusion of the germinated seed in water) and is of special use for babies and invalids[238]. Its use is said to reduce excessive lactation[238]. Barley is also used as a poultice for burns and wounds[4, 46, 176, 218]. The plant has a folk history of antitumor activity[218]. The germinating seed has a hypoglycaemic effect preceded by a hyperglycaemic action[218]. Modern research has shown that barley may be of aid in the treatment of hepatitis, whilst other trials have shown that it may help to control diabetes[254]. Barley bran may have the effect of lowering blood cholesterol levels and preventing bowel cancer[254]. Other uses for bronchitis and diarrhoea, and as a source of folic acid and vitamin B12 and B6. Weight loss[301].

propta Seed - sow in situ in March or October and only just cover the seed. Make sure the soil surface does not dry out if the weather is dry. Germination takes place within 2 weeks.

nwatta Staple Crop: Balanced carb Under DevelopmentSucceeds in most soils and in climates ranging from sub-arctic to sub-tropical[1, 171]. Easily grown in light soils[162]. Prefers a calcareous soil[7]. Best grown in a sunny position[238]. Barley first came under cultivation about 12,000 years ago[238]. It is widely cultivated in Temperate areas of the world for its edible seed, there are many named varieties[57, 183]. It succeeds further north than most other cereal crops (it succeeds in Norway at latitude 70° N[142]), and at higher altitudes (it is a staple crop in Tibet)[57, 238]. The *Coeleste* group contains the hull-less barleys. Although lower yielding than the type, these hull-less seeds are much easier to harvest making them a much easier crop to grow on a small scale[183].

## 5.2.53 *Vaccinium praestans*

Kamchatka Bilberry

4 tin 8 cyuc 4 kcaak 4 tcan 0 dwat 0.2 m hkuc  
hmmiyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli  
xre7t hjonli

drutta *Vaccinium praestans* is a deciduous Shrub growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 105]. The taste is sweet and fragrant, somewhat like a strawberry[111]. A delicious flavour[183]. The fruit is about 12mm in diameter[200].

tcanta A good ground cover for cool moist shady areas[182].

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored

seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 3cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113]. Larger divisions can be planted out direct into their permanent positions, but we have found that in general it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. In this country, plants grow better in northern England and Scotland, in southern England they need a position with plenty of light but little direct sun[11]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.54 Rhus trilobata

Skunk Bush, Basketbush, Squawbush, Three Leaf Sumac
4 tin 6 cyuc 4 kcaak 3 tcan 2 dwat 1.8 m hkuc
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli nyanhjen hjonli

drutta Rhus trilobata is a deciduous Shrub growing to 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit - raw or cooked[62, 85, 92, 94, 95, 149]. The fruit can be eaten fresh, dried, mixed with cornmeal or made into a jam[183]. The fruit is small with very little flesh, but it is produced in fairly large panicles and so is easily harvested. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[85, 92, 149, 183]. The mixture should not be boiled since this will release tannic acids and make the drink astringent. The fruit is about 6mm in diameter[200].

tcanta Basketry Deodorant Deodorant Dye Mordant Oil Repellent TanninThe leaves are rich in tannin. They can be collected as they fall in the autumn and used as a black to brown dye or as a mordant[169, 257]. The fruits can also be used as a mordant[257]. A yellow dye is obtained from the twigs[149]. black dye can be obtained when the twigs are mixed with pine gum[257]. A red-brown dye can be made from the bark and leaves[257]. A pink-tan dye can be made from the fruit[257]. The ashes of the plant can be used as a mordant to fix dyes[257]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The roots have been used as a perfume and deodorant[257]. The buds have been used on the body as a medicinal deodorant and perfume[257]. The leaves have been rubbed on the body as an insect and snake repellent[257]. Some caution should be employed here, see the notes above on toxicity[K]. The branches are tough and slender, they are stripped of their bark and split into several strands then used in basket making[46, 92, 94, 95, 149, 257].

dwatta Analgesic Antipruritic Astringent Contraceptive Deodorant Deodorant Diuretic Emetic Haemostatic Odontalgic Oxytoxic StomachicSkunk bush was employed medici-

nally by several native North American Indian tribes, who valued it especially for its astringent qualities and used it to treat a range of complaints[257]. It is little, if at all, used in modern herbalism. Due to its potentially toxic nature, it should be used with some caution and preferably only under the supervision of a qualified practitioner. The fruit is analgesic, astringent and stomachic[257]. It has been eaten as a treatment for stomach problems and grippel[257]. The dried berries have been ground into a powder and dusted onto smallpox pustules[257]. The fruit has been chewed as a treatment for toothache and also used as a mouthwash[257]. A decoction of the fruit has been used as a wash to prevent the hair falling out[257]. The leaves are astringent, diuretic, emetic and haemostatic[257]. An infusion of the leaves has been used in the treatment of head colds[257]. A decoction of the leaves has been drunk to induce impotency as a method of contraception[257]. A poultice of leaves has been used to treat itches[257]. An infusion of the bark has been used as a douche after childbirth[257]. The bark has been chewed, and the juice swallowed, as a treatment for colds and sore gums[257]. A decoction of the root bark has been taken to facilitate easy delivery of the placenta[257]. The roots have been used as a deodorant[257]. The buds have been used on the body as a medicinal deodorant and perfume[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Landscape Uses:Border, Hedge, Massing. Succeeds in a well-drained fertile soil in full sun[11, 200], but produces its best fruit when grown close to moist ground[85]. Judging by the plants native habitat it should succeed in dry soils[K]. The young growth in spring can be damaged by late frosts. This species is closely allied to *R. aromatica*[11]. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: North American native.

### 5.2.55 Schisandra chinensis

Magnolia Vine, Wu Wei Zi
4 tin 8 cyuc 4 kcaak 2 tcan 5 dwat 9 m hkuc
pcmhmmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli nyanhjen hjonli

drutta Schisandra chinensis is a deciduous Climber growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Gum-Fruit - raw or cooked[183]. Usually dried and used on jour-

Suckers often reach 4 - 6 metres tall before succumbing to blight, but they rarely manage to produce fruit[229]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.140 Juglans regia fallax

Walnut
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 30 m hkuc
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyif hjonli

drutta Juglans regia fallax is a deciduous Tree growing to 30 m (98ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[46, 61, 105]. Thin shelled[200]. An edible oil is obtained from the seed, it tends to go rancid quickly.

tcanta Herbicide OilPlants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots also produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200].

dwatta None known

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. The dormant plant is very cold-tolerant, but the young growth in spring, however, can be damaged by late frosts. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200]. The leaves of many species also secrete substances that have an inhibitory affect on plants growing underneath them. All in all this is not a very good companion plant[K]. This plant is cultivated for its edible seed in China[46, 61]. This species is notably susceptible to honey fungus[200].

### 5.2.141 Carya glabra

Sweet Pignut, Pignut hickory, Broom Hickory, Pignut Hickory

4 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 30 m hkuc
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyif hjonli

drutta Carya glabra is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to October, in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Sap SeedEdible Uses: Seed - raw or cooked[61, 101, 161]. Very variable in quality, some are sweet and pleasant whilst others are bitter and astringent[1, 2, 11, 46, 63, 183]. In general it is inferior to other hickories[117, 159]. The nut is rather small[K], has a very thick shell and contains very little edible matter[82, 226]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. Sap - tapped in spring and used as a refreshing drink. Sweet[101].

tcanta Fuel WoodWood - hard, strong, tough, very flexible. It weighs 51lb per cubic foot[235]. An excellent timber, it is used for tool handles, agricultural implements etc[46, 61, 82]. A very good fuel, burning well and giving off a lot of heat[46, 61, 82].

dwatta None known

propta Seed - requires a period of cold stratification - seed given 3 months cold stratification had a 91% germination rate[113]. Best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give some protection from the cold for at least the first winter. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Landscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Succeeds in drier soils than most members of this genus[200]. Slow growing[200]. Sometimes cultivated for its edible seed, there are some named varieties[63]. Trees take 25 - 30 years before they commence bearing seeds and peak production does not begin until they are about 80 years old[229]. Trees thrive in Britain, often bearing fruit[11]. Trees are planted for timber in Germany[50]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Special Features:North American native, Attracts butterflies, Inconspicuous flowers or blooms.

from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113].

nwatta Industrial Crop: Dye Management: Standard Other Systems: Strip intercrop Regional Crop Staple Crop: Protein-oilLandscape Uses:Firewood, Aggressive surface roots possible, Specimen. Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. Plants are best suited to deep, rich, slightly acid or neutral soil, with good drainage, but will not succeed on infertile upland soil or on soils with poor drainage[269]. The black walnut grows best areas with an annual precipitation from 30 to 130cm, an annual temperature in the range of 7 to 19°C and a pH from 4.9 - 8.2[269]. The dormant plant is very cold hardy, but the young growth in spring, however, can be damaged by late frosts. The Black walnut is one of most valuable natural forest trees in the United States[269]. A very ornamental and fast growing plant[1, 200], it is sometimes cultivated in N. America for its edible seed. Whilst potential yields of 7.5 tonnes per hectare have been postulated, it is more feasible to expect annual yields of around 2.5 tonnes per hectare[269]. Good seed crops are usually produced every other year, though some plants fruit well annually whilst others produce good crops every third year[269]. The average weight of a seed from wild trees is about 17g, though there are many named varieties and the weight of their seeds varies from 20 - 30g[183, 269]. There are breeding programmes that are seeking to develop cultivars with thinner shells[226]. Trees in the wild commence bearing seeds when about 12 years old[227]. Black walnut trees mature their fruit rather generally throughout the plants natural range where there is a growing season of about 150 days and an average summer temperature of 16.5°C[269]. Trees do not fruit very freely in Britain unfortunately[1, 11]. They grow well in the eastern half of the country but often do not thrive in the west[98]. Trees have been extensively planted for timber in parts of C. and E. Europe[50]. This species hybridizes with *J. regia*[149], some named cultivars have been developed from this cross for their seed. Plants produce a deep taproot which makes them very drought resistant when established, though they are intolerant of root disturbance[1, 11, 269]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. The black walnut is self-fertile, but the sequence of male and female blooming, called dichogamy, can often does minimize chances of a tree shedding pollen on its own pistils. In different trees pollen may be shed before the receptivity period of female flowers, or at same time, or after pistil receptivity. For greatest possible nut production, plant trees of 2 or more cvs, as different cvs have overlapping pollen-receptivity periods and can pollinate each other[269]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots also produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. Beans, peas and tomatoes are also particularly sensitive to these secretions and will not grow in the rooting zone[200]. Trees cast quite a dense shade so, along with their other anti-social tendencies, are not very friendly trees for a woodland garden[K]. The bruised leaves have a pleasant sweet though resinous smell[245]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering

from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.139 Castanea dentata

American Sweet Chestnut

4 tin 8 cyuc 4 kcak 3 tcan 1 dwat 30 m hkuc  
hmimhut cyutli hgaktyuctup hwicli hyhisrasjlutnyk hpa7tli frusflatprik hpa7tmwatli hjonli

drutta *Castanea dentata* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. kckahta Edible Parts: Oil SeedEdible Uses: Chocolate Coffee OilSeed - raw or cooked[2, 62, 63, 102, 117]. Rather on the small side, but these are the sweetest seeds of any species in this genus[183]. The seed contains about 7% fat, 11% protein[159]. It can be dried, ground into powder and then be added to cereals when making bread, cakes etc[213]. A delicious oil can be extracted from the seed by crushing the nuts, boiling them in water and then skimming off the oil as it comes to the surface[213]. It can be used as a topping for various puddings[213]. The roasted nut can be used as a coffee substitute and a chocolate substitute can also be made from it[183] (no further details).

tcanta Dye Oil Tannin WoodThe bark is a good source of tannin[46, 61, 171, 223]. The dried leaves contain 9% tannin[213]. The wood and the seed husks also contain tannin[223]. The husks contain 10 - 13% tannin[223]. A brown dye is obtained from the bark[257]. Wood - soft, not strong, light, very durable, liable to warp. It weighs 28lb per cubic foot. Easy to split, it is used for making chair furniture, fence posts, in construction etc[61, 82, 117, 171, 229, 235].

dwatta Astringent ExpectoantA warm water infusion of the leaves has been used to calm the respiratory nerves and promote expectoration[213, 257]. The infusion has also been used in the treatment of whooping cough but modern opinion is that the leaves are no more than a mild astringent[213].

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils and in hot sunny sites[1, 11, 188, 200]. Once established, it is very drought tolerant[11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Although it is very winter-hardy, this species only really thrives in areas with hot summers[200]. A tree at Kew in 1985 was 15 metres tall and thriving[11]. At one time widely cultivated in N. America for its edible seed, it is now virtually extinct in the wild due to chestnut blight[11]. There are some named varieties[183]. Trees are possibly becoming resistant, some suckering stands in America are producing fruit[11].

neys, it is very sustaining[74]. Rich in sugars[74], it has a sweet/sour flavour[178]. In Russia a paste made from the fruit is mixed with *Actinidia arguta* in order to counteract the insufficient acidity of that species[183]. The fruit is about 6mm in diameter and is borne in a grape-like bunch about 10cm long[200]. Young leaves - cooked and used as a vegetable[105, 177, 183].

tcanta Gum Hair Size WoodA viscid mucoid material is obtained from the fruit and the branches, it is used as a size for paper and as a hair dressing[178]. The dried wood is charmingly fragrant[11].

dwatta Antirheumatic Antitussive Aphrodisiac Astringent Cancer Cardiotoxic Cholagogue Dysentery Expectoant Hepatic Lenitive Nerve Pectoral Sedative Stimulant Tonic UrinaryWu Wei Zi is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. It is an excellent tonic and restorative, helping in stressful times and increasing zest for life[254]. It is considered to be a substitute for ginseng and is said to be a tonic for both the male and the female sex organs[238]. The fruit is antitussive, aphrodisiac, hepatic, astringent, cardiotoxic, cholagogue, expectoant, hypotensive, lenitive, nerve, pectoral, sedative, stimulant and tonic[174, 176, 178, 218]. Low doses of the fruit are said to stimulate the central nervous system whilst large doses depress it[218]. The fruit also regulates the cardiovascular system[218]. It is taken internally in the treatment of dry coughs, asthma, night sweats, urinary disorders, involuntary ejaculation, chronic diarrhoea, palpitations, insomnia, poor memory, hyperacidity, hepatitis and diabetes[238]. Externally, it is used to treat irritating and allergic skin conditions[238]. The fruit is harvested after the first frosts and sun-dried for later use[238]. The fruit contains lignans[254]. These have a pronounced protective action on the liver. In one clinical trial there was a 76% success rate in treating patients with hepatitis, no side effects were noticed[254]. The seed is used in the treatment of cancer[218]. The plant is antirheumatic[218]. A mucilaginous decoction obtained from the branches is useful in the treatment of coughs, dysentery and gonorrhoea[218].

propta Seed - best sown in the autumn in a cold frame[200, 238]. Pre-soak stored seed for 12 hours in warm water and sow in a greenhouse in the spring[238]. Germination can be slow and erratic. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first 2 years. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame. Overwinter in the greenhouse and plant out in late spring[11, 78]. Good percentage[78]. Layering of long shoots in the autumn[200].

nwatta Prefers a rich well-drained moisture retentive soil[11, 200]. Prefers a slightly acid soil but tolerates some alkalinity if plenty of organic matter is added to the soil[200]. Requires some protection from the most intense sunlight[200]. Plants succeed in quite deep shade and are suitable for north-facing walls[219]. Plants are intolerant of drought[K]. The fully dormant plant is hardy to about -17°C, though the young growth in spring can be damaged by late frosts. Plants climb by twining around supports. Any pruning is best carried out in the spring[219]. The flowers are sweetly scented[245]. The leaves are also aromatic[245]. Dioecious. Male and female plants must be grown if seed is required. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 5.2.56 Crambe maritima

Sea Kale

4 tin 8 cyuc 4 kcak 3 tcan 0 dwat m hkuc  
hmimhut cyutli hgaktyuctup hwicli hyhisrasjlutnyk hpa7tli prikliwshom hpa7tmwatli fyfxfre7t hjonli

drutta *Crambe maritima* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kckahta Edible Parts: Flowers Leaves Root ShootsEdible Uses: Young leaves - raw or cooked like spinach[9, 12, 37, 52, 183]. They have a pleasant almost nutty flavour and go well in a mixed salad[K]. They also make a very pleasant cooked vegetable[K]. Older leaves develop a bitterness and are not so pleasant[K]. Young shoots - raw or cooked[2, 5, 37, 46, 183]. Available in the spring, they have a delicate nutty flavour with a crisp texture[200, 264]. The shoots are usually blanched and can be cooked like asparagus[9, 183]. When properly cooked they retain their crispness and have a very agreeable flavour, somewhat like hazelnuts but with a slight bitterness[183]. Root - cooked. Rich in starch and sugars[74]. Young flower buds - raw or cooked[264]. The flowering shoots are harvested when about 10 - 15cm long and before the flowers have opened. Used like sprouting broccoli, they are quite nice raw and delicious when lightly steamed[K].

tcanta Plants can be used for ground cover when spaced about 60cm apart each way[208].

dwatta None known

propta Seed - sow March/April in a seedbed outdoors and either thin the plants out or move them to their permanent positions when about 10cm tall[111]. Plants can be cropped once they are more than 12 months old[264]. The young plants are very attractive to slugs so some protection will often be needed. Germination can be slow so it is best to sow the seed in pots in a cold frame[164]. Germination usually takes place in 3 - 26 weeks at 15°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are at least 10cm tall. Division in spring or autumn[1, 111]. Dig up the root clump and cut off as many sections as you require, making sure they all have at least one growing point. The larger of these divisions can be planted out straight into their permanent positions, though small ones are best potted up and grown on in a cold frame until they are established. Root cuttings, 3 - 10 cm long, in spring[104]. These can be planted straight into the open ground or you can pot them up in the greenhouse and plant them out once they are growing strongly.

nwatta An easily grown plant, succeeding in a good loam and an open sunny position[1, 111, 200] but also tolerating some shade[188]. Prefers a slightly alkaline soil in a position sheltered from strong winds[200] (this report totally conflicts with the plants native habitat which is on sea shores - we have found this species to be very tolerant of strong maritime winds though it does not like cold northerlies much[K]). Tolerates poor soil and some shade[200]. Dislikes acid[11] and very stiff soils[37]. Prefers a rich, well-drained very deep sandy loam and a pH of 7[104, 264]. Established plants are very drought tolerant[190]. This species is hardy to about -20°C[187], it grows best in a cool maritime climate[200]. Seakale is sometimes cultivated for its edible young shoots in the spring which are blanched by excluding light in order to make them less bitter[61, 264]. Two or three crops can usually be harvested each year[264]. There are some named varieties[183]. The roots are sometimes brought into a greenhouse in the winter and grown on there in order to produce an early crop of shoots[183]. A deep-rooted and very long-lived plant[233, 264], it dislikes root disturbance[164]. The seed is dispersed by seawater, on which it can float for several days without loss of viability[17]. A good bee plant[115]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter tem-

peratures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.57 Cornus mas

Cornelian Cherry, Cornelian Cherry Dogwood  
4 tlin 8 cyuc 4 kcaak 3 tcan 2 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprikliw  
wissip hpa7tmwatli xre7t hjonli  
drutta Cornus mas is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from February to March, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit Oil OilEdible Uses: Coffee Oil OilFruit - raw, dried or used in preserves[2, 3, 7, 9, 13, 183]. Juicy, with a nice acid flavour[11]. The fully ripe fruit has a somewhat plum-like flavour and texture and is very nice eating, but the unripe fruit is rather astringent[K]. It is rather low in pectin and so needs to be used with other fruit when making jam[9]. At one time the fruit was kept in brine and used like olives[183]. The fruit is a reasonable size, up to 15mm long, with a single large seed[K]. A small amount of edible oil can be extracted from the seeds[7]. Seeds are roasted, ground into a powder and used as a coffee substitute[183].

tcanta Dye Hedge Hedge Oil Oil Tannin WoodAn oil is obtained from the seed[7]. A dye is obtained from the bark[3, 7]. No more details are given. Another report says that a red dye is obtained from the plant, but does not say which part of the plant[4]. The leaves are a good source of tannin[7]. Wood - very hard, it is highly valued by turners[7]. The wood is heavier than water and does not float[7]. It is used for tools, machine parts, etc[7, 11, 13, 61].

dwatta Astringent Cholera Febrifuge NutritiveThe bark and the fruit are astringent, febrifuge and nutritive[7]. The astringent fruit is a good treatment for bowel complaints and fevers, whilst it is also used in the treatment of cholera[4, 254]. The flowers are used in the treatment of diarrhoea[4].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Border, Firewood, Pest tolerant, Hedge, Screen, Specimen, Woodland garden. An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Prefers a moist soil[108] and a sunny position[15] but also succeeds in light shade[188]. Plants

are fairly wind resistant[K]. Plants grow and crop well in pots. A very hardy plant, tolerating temperatures down to about -25°C[184]. At one time the cornelian cherry was frequently cultivated for its edible fruit, though it has fallen into virtual disuse as a fruit crop in most areas[3]. It is still being cultivated in parts of C. Europe and there are some named varieties[183]. 'Macrocarpa' has larger fruits than the type[182]. 'Nana' is a dwarf form, derived from a yellow-fruited clone[182]. 'Variegata' has been seen on a number of occasions with very large crops of fruit, even in years when the type species has not fruited well[K]. 'Jolico' has well-flavoured fruits 3 times larger than the species. There are also a number of cultivars with yellow, white and purplish fruit. Seedlings can take up to 20 years to come into fruit. Plants produced from cuttings come into fruit when much younger, though they do not live as long as the seedlings. A very ornamental plant[1] it flowers quite early in the year and is a valuable early food for bees[13, 108]. Plants in this genus are notably resistant to honey fungus[200].Special Features:Attracts birds, Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.2.58 Lilium lancifolium

Tiger Lily, Devil Lily  
4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 1.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw  
hpa7tmwatli dyaxre7t hjonli

drutta Lilium lancifolium is a BULB growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb-cooked[2, 4, 42, 47]. Somewhat bitterish[105]. Fairly pleasant, when properly cooked they are highly esteemed as a vegetable and somewhat resemble parsnips in flavour[183]. The bulbs are up to 8cm in diameter[266]. They are a good source of starch[105, 183]. The bulb can be dried and ground into powder. Flowers - raw or cooked. Used fresh or dried in salads, soups, rice dishes etc[183].

tcanta None known  
dwatta Antiinflammatory Cardiac Carminative Diuretic Emmenagogue Emollient Expectorant Ophthalmic Women's complaintsThe bulb is antiinflammatory, diuretic, emmenagogue, emollient and expectorant[240, 279]. They are used to relieve heart diseases, pain in the cardiac region and angina pectoris[240]. They are used in Korea to treat coughs, sore throats, palpitations and boils[279]. The flowers are carminative[240]. They are used to strengthen the eye-lid muscles and are commended in the treatment of myopic astigmatism[240]. A tincture made from the flowering plant, harvested when in full flower, is used in the treatment of uterine neuralgia, congestion, irritation and the nausea of pregnancy[4]. It relieves the bearing-down pain accompanying

acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[51, 177, 272]. An edible oil is obtained from the seed, it tends to go rancid quickly[51].

tcanta Herbicide Oil Tannin WoodThe bark and the unripe rind of the fruit are good sources of tannin[51, 272]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots also produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200]. Wood - hard, strongly grained, polishes well. Used for making furniture, carved work, veneers etc[51, 272].

dwatta Alterative Anthelmintic Antirheumatic Astringent Detergent TonicThe bark, leaves and fruit are used medicinally[51]. No more details are given in this report but another report on Indian medicinal plants gives the following uses for J. nigra (and almost certainly refers to this subspecies):- The bark is anthelmintic and detergent[240]. The leaves are anthelmintic, astringent and tonic[240]. A decoction is considered to be specific in the treatment of strumous sores[240]. The fruit is alterative[240]. It is used in the treatment of rheumatism[240].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. The dormant plant is quite cold-tolerant, but the young growth in spring, however, can be damaged by late frosts. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200]. The leaves of many species also secrete substances that have an inhibitory affect on plants growing underneath them. All in all this is not a very good companion plant[K]. This plant is cultivated for its edible seed in W. Himalayas[51]. This species is notably susceptible to honey fungus[200].

### 5.2.138 Juglans nigra

Black Walnut  
4 tlin 9 cyuc 3 kcaak 4 tcan 3 dwat 30 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw  
hpa7tmwatli fyif hjonli

drutta Juglans nigra is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral

and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil Sap SeedEdible Uses: Oil SweetenerSeed - raw or cooked. A sweet, rich distinctive delicious flavour it makes an excellent dessert nut and is also widely used in confections, cakes etc[2, 34, 82, 183]. The kernel is hard to extract and the oil it contains quickly turns rancid[101, 159]. The unripe fruits can be pickled[183]. The seed is borne in solitary fruits or in pairs and is 3 - 4cm in diameter[82, 229]. The nuts can leave a permanent stain on clothing[226]. An edible oil is obtained from the seed[101, 183]. A sweet taste but it tends to go rancid quickly[159]. Used as a seasoning in bread, squash and other foods[183]. The tree yields a sweet sap that can be drunk or concentrated into syrup or sugar[101, 102, 183]. It is tapped in spring.

tcanta Beads Compost Dye Filter Herbicide Insecticide Oil Repellent Tannin WoodA brown dye is obtained from the nuts, husks and bark[14, 57, 101, 159]. It does not require a mordant[169]. The husks can be dried for later use[169]. A brown dye is obtained from the leaves and stems[168]. It does not require a mordant[168]. The dye turns black if it is prepared in an iron pot[168]. The leaves can be dried for later use[169]. The husks are rich in tannin[226]. The green fruit husks can be boiled to provide a yellow dye[269]. The husks can be made into a high quality coal (does the report mean charcoal?[K]) and is then used as a filter[226]. It was used in gas masks[226]. The woody shells on the fruits have been used to make jewellery[269]. Insects are said to avoid the walnut tree, hence it is often used as a poor man's insect repellent. When rubbed on faces, walnut leaves are said to repel flies[269]. The leaves repel fleas and have been used as a strewing herb[20, 201, 257]. They are also used as an insecticide against bed bugs[222]. The ground up husks are also insecticidal[226]. The leaves produce substances that depress the growth of other plants. These substances are washed onto the ground by rain and inhibit the growth of plants beneath the tree[18, 20, 159]. The roots also produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200]. An alternative ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. Wood - very ornamental, heavy, hard, strong, close-grained, very durable. Easily worked, it glues well, does not warp, shrink or swell much and takes a good polish. It weighs 38lb per cubic foot. A very valuable timber tree and possibly the most sought after wood in N. America, it is used in cabinet making, the interior finishes of houses, furniture, airplanes, ship building, veneer etc[1, 46, 61, 82, 101, 149, 227, 229, 235, 269]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Alterative Anodyne Antiinflammatory Astringent Blood purifier Detergent Eczema Laxative Leprosy Pectoral VermifugeThe bark and leaves are alterative, anodyne, astringent, blood tonic, detergent, emetic, laxative, pectoral and vermifuge[4, 222, 257]. Especially useful in the treatment of skin diseases, black walnut is of the highest value in curing scrofulous diseases, herpes, eczema etc[4]. An infusion of the bark is used to treat diarrhoea and also to stop the production of milk, though a strong infusion can be emetic[21, 257]. The bark is chewed to allay the pain of toothache and it is also used as a poultice to reduce the pain of headaches[222, 257]. The juice from the fruit husk is applied externally as a treatment for ringworm[222, 257]. The husk is chewed in the treatment of colic and applied as a poultice to inflammations[222]. The burnt kernels, taken in red wine, are said to prevent falling hair, making it fair[269]. Green husks are supposed to ease the pain of toothache[269]. A tea made from the leaves is astringent[222]. An infusion has been used to lower high blood pressure[257]. It can be used as a cleansing wash[21]. The pulverized leaves have been rubbed on the affected parts of the body to destroy ringworm[257]. The oil from the ripe seeds has been used externally in the treatment of gangrene, leprosy, and wounds[269]. The sap has been used to treat inflammations[257].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it



Plants can come into bearing in 3 - 4 years from seed[63]. Even when grown on a very windy site in Cornwall, the plants flowered in their eighth year from seed (by which time they were more sheltered from the wind)[K] Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and then given some protection since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them[K]. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.136 *Origanum vulgare hirtum*

Greek Oregano  
4 tin 8 cyuc 4 kca3 3 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli kyuctup hwicli hysrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Origanum vulgare hirtum* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Condi-mentLeaves - raw or cooked as a potherb[5, 52, 183]. Oregano is an important flavouring herb in Mediterranean cookery, and is often used dried rather than fresh[238]. This sub-species has a much stronger flavour than the type[238]. The leaves are used as a flavouring for salad dressings, vegetables and legumes, and are frequently included in strongly flavoured dishes with chillies, garlic, onions etc[2, 13, 21, 27, 183, 238]. A nutritional analysis is available[218]. Much of the commercially available dried oregano does not come from this plant but from a number of different, often unrelated plants[238]. These include *Lippia graveolens*, *L. palmeri* and *Origanum syriacum*[238]. A herb tea is made from the dried leaves and flowering stems[183, 207, 238].

tcanta Dye Essential RepellentAn essential oil from the plant is used as a food flavouring, in soaps and perfumery[115, 171]. A red or purple dye is obtained from the flowering tops[4, 7, 13, 100], it is neither brilliant nor durable[115]. The plant repels ants[46]. A useful ground cover for sunny positions, forming a slowly spreading clump[197, K].

dwatta Antiseptic Antispasmodic Carminative Cholagogue Diaphoretic Emmenagogue Expectorant Stimulant Stomachic TonicOregano has been used as a culinary and medicinal herb for thousands of years. It has a beneficial effect upon the digestive and respiratory systems and is also used to promote menstruation[254]. It should not be used medicinally by pregnant women though it is perfectly safe in small amounts for culinary purposes[254]. The leaves and flowering stems are strongly antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, emmenagogue, expect-

torant, stimulant, stomachic and mildly tonic[4, 7, 9, 21, 254]. The plant is taken internally in the treatment of colds, influenza, mild febrish illnesses, indigestion, stomach upsets and painful menstruation[238]. It is strongly sedative and should not be taken in large doses, though mild teas have a soothing effect and aid restful sleep[244]. It should not be prescribed for pregnant women[238]. Externally, oregano is used to treat bronchitis, asthma, arthritis and muscular pain[238]. The plant can be used fresh or dried - harvest the whole plant (but not the roots) in late summer to dry and store for winter use[244]. Oregano is often used in the form of an essential oil that is distilled from the flowering plant[4]. A few drops of the essential oil, put on cotton wool and placed in the hollow of an aching tooth, frequently relieves the pain of toothache[4, 207]. This plant is one of the best natural antiseptics because of its high thymol content[7]. The essential oil is used in aromatherapy to treat the same kinds of complaints that the herb is used for[238].

propta Seed - sow early spring at 10 - 13°C and only just cover the seed. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late spring. Division in March or October. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings of young barren shoots in June. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Requires a rather dry, warm, well-drained soil in full sun, but is not fussy as to soil type, thriving on chalk[1, 27]. Prefers slightly alkaline conditions[200]. Tolerates poor soils[24]. Dislikes wet soils[37]. Often cultivated as a culinary herb, this is a sub-species from Greece, its flowers are white and it has a stronger fragrance. It is more commonly grown commercially because of its stronger fragrance. There are some named forms[183]. Plants growing near the sea have the most fragrance[7]. A good companion plant, improving the flavour of nearby plants. The flowers are very attractive to bees and butterflies[5, 30]. A good companion for the cucumber family[14], it is beneficial to all nearby plants[20]. The whole plant is strongly aromatic. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 10 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.137 *Juglans regia kamaonia*

Walnut

4 tin 8 cyuc 3 kca3 0 tcan 3 dwat 30 m hkuc  
htut cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Juglans regia kamaonia* is a deciduous Tree growing to 30 m (98ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly

uterine prolapse and is an important remedy in ovarian neuralgia[4].

propta Seed - this species is completely sterile and does not produce seed. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. Bulbils - gather in late summer when they start to fall off the stems and pot up immediately. Grow on in a greenhouse until large enough to go outside[200]. Plants can flower in three years from bulbils[4].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Seashore. Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Prefers a lime-free soil according to some reports[28, 47, 143], whilst one says that it succeeds in a calcareous soil[1] and another that it succeeds in ordinary garden soil[1, 42]. Prefers a deep acid loam[47]. Likes a sunny position according to one report[143] whilst others say that it is best grown in open woodland or amongst dwarf evergreen shrubs[1]. Stem rooting, the bulbs should be planted 15 - 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Plants grow well in northern gardens in Britain[90]. A sterile triploid species, probably of hybrid origin[90]. A very ornamental plant[1], it is cultivated for its edible bulb in Japan[2, 42, 163]. This species tolerates virus infections, but it can transmit them to other species in this genus and so is best grown away from any of the other species[47]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

## 5.2.59 *Morus alba multicaulis*

White Mulberry

4 tin 8 cyuc 4 kca3 0 tcan 3 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Morus alba multicaulis* is a deciduous Tree growing to 18 m (59ft 1in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Inner bark LeavesEdible Uses: Fruit - raw[2, 7, 158]. Sweet but usually insipid[3, 11]. It contains about 1.5% protein, 0.4% fat, 7.8% carbohydrate, 0.7% malic acid[179]. A richer flavour develops if the fruit is dried, it can then be used as a raisin substitute. The fruit is up to 25mm long[200]. Some caution is advised, see the notes above on toxicity. Young leaves and shoots - cooked[105, 183]. A famine food, it is only used when all else fails[177]. A good vegetable, it is rich in carotene and calcium[179]. The leaf also contains 10% tannin[179]. Inner bark - roasted and ground into a meal then used as a thickener in soups etc or mixed with cereals when making bread. A famine food when all else fails[179]. The tree is said to be a source of an edible manna[183]. Young shoots can be used as a tea substitute[183].

tcanta Dye Fibre WoodA fibre is obtained from the bark of one-year old stems, it is used in weaving[7, 74]. A brown dye is obtained from the trunk[178]. The leaves contain 10% tannin[179]. Wood - hard, durable, fine and close-grained. Used for boat building, furniture etc[145, 149, 158].

dwatta Analgesic Antisthmatic Antirheumatic Antitussive Astringent Diaphoretic Diuretic Emollient Expectorant Hypoglycaemic Hypotensive Odontalgic Sedative Urinary-The white mulberry has a long history of medicinal use in Chinese medicine, almost all parts of the plant are used in one way or another[238]. Recent research has shown improvements in elephantiasis when treated with leaf extract injections and in tetanus following oral doses of the sap mixed with sugar[238]. Analgesic, emollient, sedative[7, 176]. The leaves are antibacterial, astringent, diaphoretic, hypoglycaemic, odontalgic and ophthalmic[218, 238]. They are taken internally in the treatment of colds, influenza, eye infections and nosebleeds[238]. The leaves are collected after the first frosts of autumn and can be used fresh but are generally dried[238]. The stems are antirheumatic, diuretic, hypotensive and pectoral[218, 238]. A tincture of the bark is used to relieve toothache[7]. The branches are harvested in late spring or early summer and are dried for later use[238]. The fruit has a tonic effect on kidney energy[218, 238]. It is used in the treatment of urinary incontinence, tinnitus, premature greying of the hair and constipation in the elderly[238]. The root bark is antitussive, diuretic, expectorant and hypotensive[238]. It is used internally in the treatment of asthma, coughs, bronchitis, oedema, hypertension and diabetes[238]. The roots are harvested in the winter and dried for later use[238]. Extracts of the plant have antibacterial and fungicidal activity[218].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to three-quarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. This variety of *M. alba* is said to have superior fruits[105]. According to many botanists it is no more than a clone of the species[200]. This is the form most commonly cultivated in India, where it is fast growing and adapted to field culture. It gives a high yield of large, tender, thick leaves[269]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. A good tree for growing grapes into[20]. The grapes are difficult to pick but always seem to be healthier and free from fungal diseases[201]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.60 *Amaranthus blitum*

Slender Amaranth, Purple amaranth

4 tin 8 cyuc 4 kca3 2 tcan 2 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjnutnyik hpa7tli frusflatprikliwis hpa7tmwatli fyif hjonli

drutta *Amaranthus blitum* is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from April to October, in flower in August, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: ColouringLeaves - raw or cooked as a spinach[2, 4, 55, 183]. The leaves contain about 3.88% protein, 1.1% fat, 9.38% carbohydrate, 3.2% ash, 323mg Ca, 8.3mg Fe, they are very rich in Vitamins A and C, rich in vitamin B1[179]. The leaves are used as a potherb in order to remove poison from the system[218]. Seed - cooked. Used as a cereal substitute in cakes, porridge etc[55, 183]. Very small, about 1.2mm in diameter[266], but it is easy to harvest and very nutritious. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K]. An edible dye is obtained from the seed capsules[4].

tcanta DyeYellow and green dyes can be obtained from the whole plant[168].

dwatta AstringentA fluid extract of the plant is used as an astringent internally in the treatment of ulcerated mouths and throats, externally as a wash for ulcers and sores[4]. The juice of the roots is used externally to relieve headaches[272]. The plant has a folk reputation for being effective in the treatment of tumours and warts[218].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Often cultivated, especially the form oleraceus, the plant succeeds from the temperate zone through to the tropics. It grows best in areas where annual daytime temperatures are within the range 21 - 27°c, but can tolerate 18 - 32°c[418 ]. It can be killed by temperatures of 4°c or lower[418 ]. It prefers a mean annual rainfall in the range 1,200 - 1,500mm, but tolerates 200 - 2,700mm[418 ]. Prefers a well-drained fertile soil in a sunny position[200 ]. Requires a hot sheltered position if it is to do well[K ]. Prefers a pH in the range 5.5 - 7, tolerating 4.3 to 7.5[418 ]. The plant has become a weed in many areas of the world outside its original range. It is classified as 'invasive' in many Pacific Islands[305 ]. Plants are particularly susceptible to attacks by leaf-chewing insects[298 ]. Plants should not be given inorganic fertilizers, see notes above on toxicity. This plant was cultivated by the ancient Romans and Greeks for its edible leaves, there are some named varieties[183 ]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196 ]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 5.2.61 Hemerocallis littorea

Coastal Day Lily

4 tin 8 cyuc 4 kcak 2 tcan 1 dwat 0.9 m hkuc hmimhtut cyulti kyuctcup hwicli hrasjlutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis littorea is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177]. They can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked. A pleasant nutty flavour. This sub-species has a fibrous root system[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Attractive flowers.

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[200] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Plants are hardy to about -15°c[187]. The plant has a fibrous root system[205]. Individual flowers are short-lived, opening in the morning and withering in the evening. The plant, however, produces a succession of flowers over a period of about 6 weeks[205]. Hybridizes freely with other members of this genus[200]. Unlike the type species, this form does produce viable seed[187]. Plants take a year or two to become established after being moved[200]. They can then spread quite freely[K]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

## 5.2.62 Acer saccharum

Sugar Maple, Florida Maple, Hard Maple, Rock Maple

4 tin 8 cyuc 4 kcak 4 tcan 2 dwat 30 m hkuc hmimhtut cyulti tcup hwicli hrasjlutnyikfrip hpa7tli frusflat-prikliwis hpa7tmwatli xre7t hjonli

drutta Acer saccharum is a deciduous Tree growing to 30 m (98ft) by 12 m (39ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner bark Leaves Sap SeedEdible Uses: SweetenerThe sap contains quite a large proportion of sugar. This can be used as a refreshing drink, or be concentrated into a syrup by boiling off the water[1, 2, 11, 34, 57]. The syrup is used as a sweetener on many foods. The sap can be harvested in late winter or early spring[142]. The flow is best on a warm sunny day after a frost[213]. Trees on southern slopes in sandy soils give the best yields. It is best to make a hole about 7cm deep and about 1.3 metres above the ground[171]. Yields of 40 - 100 litres per tree can be obtained[142]. The best sap production comes from cold-winter areas with continental climates. The sap contains 2 - 6% sugar, thus about 32 litres are required to make a litre of maple syrup[229]. Self-sown seedlings, gathered in early spring, are eaten fresh or dried for later use[213]. Seeds - cooked. The wings are removed and the seeds boiled then eaten hot[62, 105, 159, 213]. The seed is about 6mm long and is produced in small clusters[82]. Inner bark - cooked. It is dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 161]. The related Oregon Maple (*Acer macrophyllum*) has yellow flower clusters, sweet with nectar, eaten raw[183]. No information was found for this species.

tcanta Companion Fodder Fuel Potash Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - close grained, tough, hard, heavy, strong, not very durable, it takes a high polish, remains smooth under abrasion and has a high shock-

honey fungus[200]. Fruits are usually freely produced in Britain, but they do not always ripen[11, 182]. The plant grows and fruits well on a south wall at Kew[K]. A good bee plant, flowering early in the year and providing pollen and nectar[108]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching; a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.134 Balsamorhiza sagittata

Oregon Sunflower, Arrowleaf balsamroot

4 tin 8 cyuc 4 kcak 2 tcan 2 dwat 0.3 m hkuc htut cyulti kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Balsamorhiza sagittata is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Root Seed Shoots StemEdible Uses: CoffeeRoot - raw or cooked[46, 61, 106, 161, 257]. The root has a thick crown that is edible raw[213]. Roots have a sweet taste when cooked[2, 183]. A long slow baking is best, the Flathead Indians would bake them in a fire pit for at least 3 days[183]. The roots are resinous and woody with a taste like balsam[212]. Young shoots - raw or cooked[161, 257]. Added to salads or used as a potherb[183]. The large leaves and petioles are boiled and eaten[207]. When eaten in large quantities they act like sleeping pills to cause sleepiness[257]. The young flowering stem can be peeled and eaten raw like celery[183, 257]. Seed - raw or cooked[2, 94, 101, 161]. A highly prized source of food[257]. It can be roasted, ground into a powder and used with cereals when making bread[183, 257]. The raw seed can also be ground into a powder then formed into cakes and eaten without cooking[257]. The seed is rich in oil[213]. Oil. The seed was a prized source of oil for many native North Americans[257]. The roasted root is a coffee substitute[177, 183].

tcanta Hair InsulationThe large hairy leaves are used as an insulation in shoes to keep the feet warm[99]. An infusion of the root has been rubbed into the scalp to promote hair growth[257].

dwatta Antirheumatic Diaphoretic Diuretic Dysentery Febrifuge Odontalgic Poultice Skin Stomachic VulneraryOregon sunflower was quite widely employed as a medicinal herb by various native North American Indian tribes who used it to treat a variety of complaints, but especially stomach problems[257]. It is little used in modern herbalism. The root is antirheumatic, diuretic, cathartic, diaphoretic, febrifuge and vulnerary[94, 257]. An infusion of the leaves, roots and stems has been used as a treatment for stomach pains, colds, whooping cough, TB, fevers and headaches[257]. A decoction of the root has been taken at the beginning of labour to insure easy delivery[257]. The juice from the chewed root is allowed to trickle down the throat to treat sore mouths and throats whilst the root has also been chewed to treat toothaches[257]. The smoke from the root has been inhaled as a remedy for body aches such as rheumatism[257]. The root is chewed or pounded and used as a paste on wounds, blisters, bites, swellings and sores[207, 257]. A poultice made from the coarse, large leaves has been used to treat severe burns[257]. An infusion of the leaves has been used as a wash for poison ivy rash and running sores[257]. The seeds have been eaten as a treatment for dysentery[257].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination usually takes place within 2 - 6 days at 18°c. Either sow the seed in individual pots or pot up the seedlings as soon as they are large enough to handle and plant them out into their permanent positions in the summer[134]. Division in spring. Very difficult since the plant strongly resents root disturbance[134]. It is probably best to take quite small divisions, or basal cuttings, without disturbing the main clump. Pot these up into individual pots and keep them in light shade in the greenhouse until they are growing away well. Plant them out in the summer if they

have grown sufficiently, otherwise over-winter them in the greenhouse and plant out in late spring.

nwatta Requires a deep fertile well-drained loam in full sun[134, 200]. Plants strongly resent winter wet[134, 200]. Hardy to at least -25°c[200]. Plants are intolerant of root disturbance and should be planted into their permanent positions whilst still small[134]. They withstand heavy grazing in the wild[212]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.135 Juglans ailanthifolia cordiformis

Heartseed Walnut

4 tin 8 cyuc 4 kcak 4 tcan 1 dwat 20 m hkuc htut cyulti tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Juglans ailanthifolia cordiformis is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: OilSeed - raw or cooked[183]. They are also used in sweets, pies etc[183]. A mild and pleasant flavour, they can be eaten in quantity for dessert[183]. The shell is thin and easily cracked[117]. It is considered to be superior in taste to *C. ailanthifolia*. An edible oil is obtained from the seed[183], though it tends to go rancid quickly. Young buds (leaf?) and peduncles - cooked[105, 177].

tcanta Dye Herbicide Oil Tannin WoodA brown dye is obtained from the seed husks and the bark[61]. Rich in tannin, it does not require a mordant. The bark is rich in tannin. It is used as a dye and also medicinally[178]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. Wood - soft, light, not easily cracked, of good quality. Used for cabinet making etc[46, 61].

dwatta Anthelmintic Astringent Diuretic Kidney Lithontripic Pectoral Skin TonicThe bark is anthelmintic, astringent, diuretic, lithontripic, pectoral, skin, tonic (kidneys)[178].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80].

nwatta Management: Standard Other Systems: Strip intercrop Regional Crop Staple Crop: Protein-oilRequires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. This is the hardiest member of the genus[63], it should succeed outdoors in most parts of the country. It is also resistant to most insects[160]. The young growth in spring, however, can be damaged by late frosts. This is a form of *C. ailanthifolia* with a thinner shell and a better tasting nut. It is cultivated for its edible seed in Japan and has the potential for producing very superior nuts, especially if hybridized with *J. cinerea*[117, 160]. There are some named varieties[183].

## 5.2.131 *Campanula takesimana*

Korean Bellflower

4 tin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmmihtut cyutli tcup hwicli hrasjlut hpa7tli prikklwis  
hpa7tmwatli fyfjre7t hjonli

drutta *Campanula takesimana* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root Edible Uses: Leaves - raw or cooked[K]. A mild flour with a subtle sweetness, especially in the spring and early summer they taste just like lettuce and are a pleasant addition to mixed salads[K]. In the height of summer, the leaves often develop a slightly bitter flavour, especially if the plant is growing in a sunny position[K]. Flowers - raw. Beautiful to look at, the flowers have a delicate sweetness and are a pleasant addition to salads[K]. Roots - raw, cooked or dried for later use. Known as 'do-ra-jee' in Korea, where they are eaten as a delicacy. The roots are a bit small and fiddly to utilize, though they are said to have a simply delicious flavour.

tcanta None known  
dwatta None known

propta Seed - surface sow May/June in situ. The seed usually germinates in 2 - 4 weeks at 18°C[138]. If the seed is in short supply it would be best to sow it in pots in a cold frame in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Succeeds in most well-drained soils[233]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. This species is closely related to *C. punctata*[233, 271]. The plant spreads freely at the roots and can become rampant in lighter soils, though it is easily controlled by hoeing (or eating!)[233, 271, K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.132 *Hordeum distichon*

Two-Rowed Barley

4 tin 8 cyuc 4 kcaak 0 tcan 3 dwat 1.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Hordeum distichon* is an ANNUAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Seed Edible Uses: Coffee Salt Sweetener Seed - cooked. The seed can be ground into a flour and used as a cereal in making bread, porridge etc[1, 4, 34, 46]. Malt is obtained by sprouting and roasting the seed, then boiling the seed. The resulting liquid is a sweet substance that is used in making beer and as a food[4, 46]. The longer the seed is roasted, the darker this liquid will be. The roasted (unsprouted) seed is used as a coffee and a salt substitute[46].

tcanta Biomass Mulch Paper The stems, after the seed has been harvested, have many uses. They are a source of

fibres for making paper, a biomass for fuel etc, they can be shredded and used as a mulch[141, 171].

dwatta Antidiarrhoeal Demulcent Nutritive Urinary Barley grain is an excellent food for convalescence, either in the form of porridge or as a decoction of the seed. It is soothing to the throat and provides easily assimilated nutrients[4, 254]. It can also be taken to clear catarrh. Its demulcent properties soothes inflammation of the gut and urinary tract[254]. It is commonly given to children suffering minor infections or diarrhoea and is particularly recommended as a treatment for feverish states and in catarrhal affections of the respiratory and urinary organs[4, 254]. Made into a poultice, the seed is an effective remedy for soothing and reducing inflammation in sores and swellings[254]. Modern research has shown that barley may be of aid in the treatment of hepatitis, whilst other trials have shown that it may help to control diabetes[254]. Barley bran may have the effect of lowering blood cholesterol levels and preventing bowel cancer[254].

propta Seed - sow in situ in March or October and only just cover the seed. Make sure the soil surface does not dry out if the weather is dry. Germination takes place within 2 weeks.

nwatta Succeeds in most soils and in climates ranging from sub-arctic to sub-tropical[1, 171]. Easily grown in light soils[162]. Widely cultivated in temperate zones, especially in cooler or moister areas, for its edible seed[1, 50, 171]. There are many named varieties. This species is sometimes considered to be no more than a sub-species of *H. vulgare*[61].

## 5.2.133 *Chaenomeles cathayensis*

Chinese Quince

4 tin 8 cyuc 4 kcaak 0 tcan 2 dwat 3 m hkuc  
hmmihtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Chaenomeles cathayensis* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit Edible Uses: Fruit - very harsh raw but fragrant when cooked[1, 3, 4, 11, 177]. It makes an excellent jelly[183] and a very good jam, it is especially good cooked with apples in apple pies[K]. The fruit is very large and can be 15cm long and 9cm wide[200].

tcanta None known

dwatta Antiemetic Antirheumatic Antispasmodic Digestive The fruit is antiemetic, antirheumatic, antispasmodic and digestive[176]. It is used in the treatment of rheumatic pain, convulsions of the calf muscles, vomiting, dyspepsia and diarrhoea[176].

propta Seed - best sown as soon as it is ripe in a sheltered position outdoors or in a cold frame[200]. Sow stored seed in February in a greenhouse[78]. Germination usually takes place within 6 weeks[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle. If well grown, these seedling can be large enough to plant out in the summer, but give them some protection in their first winter. Otherwise plant them out in late spring of the following year[K]. Cuttings of half-ripe wood, July/August in a frame[11]. Cuttings of mature wood of the current year's growth, November in a cold frame. Layering in late spring or in autumn. This is a sure and easy method, though it takes 12 months[78, 200].

nwatta Easily cultivated in any reasonably good soil[1, 200]. Prefers a deep moist well-drained loam[4, 11]. Grows well in heavy clay soils. Tolerates full shade but requires a sunny position for best fruit production[3, 11, 200]. Becomes chlorotic on very alkaline soils[188, 200]. Tolerates atmospheric pollution[200]. A very ornamental plant[1], it is hardy to about -25°C[200]. Plants are subject to canker, especially when growing in the milder moister areas of Britain[49]. Plants in this genus are notably resistant to

resistance[46, 61, 82, 171, 227]. It holds nails well, is fair in gluing, dries easily and shrinks moderately[227]. The wood weighs 43lb per cubic foot[235]. Considered by many to be the most valuable hardwood tree in N. America, the sugar maple is used for a wide range of applications including furniture, flooring, turnery, musical instruments and ship building[46, 61, 82, 171, 227]. Accidental forms with the grain curled and contorted, known as curly maple and bird's eye maple, are common and are highly prized in cabinet making[82]. The wood is also a very good fuel, giving off a lot of heat and forming very hot embers[82, 226]. The ashes of the wood are rich in alkali and yield large quantities of potash[82]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Blood tonic Diuretic Expectorant Hepatic Ophthalmic A tea made from the inner bark is a blood tonic, diuretic and expectorant[222]. It has been used in the treatment of coughs, diarrhoea etc[222]. A compound infusion of the bark has been used as drops in treating blindness[257]. The sap has been used for treating sore eyes[257]. The inner bark has been used as an expectorant and cough remedy[257]. Maple syrup is used in cough syrups and is also said to be a liver tonic and kidney cleanser[222].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. A lot of the seed is non-viable, it is best to cut a few open to see if there is an embryo[113]. An average of 95% germination can be achieved from viable seed[98]. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate, sometimes taking two years[125]. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Agroforestry Services: Crop shade Fodder: Bank Management: Standard Regional Crop Staple Crop: Sugar Landscape Uses: Firewood, Screen, Specimen, Street tree, Woodland garden. Of easy cultivation, it prefers a good moist well-drained soil but succeeds on most soils[11, 98], though it is more likely to become chlorotic as a result of iron deficiency on alkaline soils. Grows well in heavy clay soils. Trees need full light and a lot of space[98]. This species is one of the most shade tolerant of the N. American maples[226]. It tolerates atmospheric pollution[200] and so is often used as a street tree, though it can suffer from soil compaction and the use of salt on the roads in frosty weather. Tolerates a pH in the range 4.5 to 7.3. Hardy to about -45°C when fully dormant[160]. A fast-growing tree for its first 40 years in the wild[229], this species is not a great success in Britain[1], though it does better than once thought[11]. It grows well in Cornwall[59]. In cultivation it has proved to be slow growing when young[11]. Trees can live for 250 years in the wild[229]. A very ornamental tree[1] but a bad companion plant, inhibiting the growth of nearby plants[18, 20]. This species is commercially exploited in America for its sap[1, 11]. Along with its sub-species it is the major source of maple syrup[11]. There are some named varieties[183]. The sap can be tapped within 10 - 15 years from seed but it does not flow so well in areas with mild winters[160]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat

Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

## 5.2.63 *Aralia cordata*

Udo

4 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 1.8 m hkuc  
pimmhim cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Aralia cordata* is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5 and is frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves Root Shoots Stem Edible Uses: Young branched shoots - cooked or raw[2, 46, 61, 105, 177, 279]. They can be up to 1.5 metres long and have a mild and agreeable flavour[116]. They are usually blanched and are crisp and tender with a unique lemon-like flavour[183]. They can be sliced and added to salads, soups etc[206]. The shoots contain about 1.1% protein, 0.42% fat, 0.8% soluble carbohydrate, 0.55% ash[179]. Root - cooked[22, 105, 177]. Used like scorzonera[2].

tcanta None known

dwatta Analgesic Antiinflammatory Carminative Diuretic Febrifuge Stimulant Stomachic Tonic The root is sometimes used in China as a substitute for ginseng (*Panax species*)[218]. It is said to be analgesic, antiinflammatory, carminative, diuretic, febrifuge, stimulant, stomachic and tonic[218, 279]. The root contains an essential oil, saponins, sesquiterpenes and diterpene acids[279]. It is used in Korea to treat the common cold and migraines[279].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Store cuttings 8cm long, December in a cold frame[11, 78]. Root the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Prefers a good deep loam and a semi-shady position[1, 134]. Requires a sheltered position[1]. Plants are harder when grown in poorer soils[200]. Tolerates a pH in the range 5.0 to 7.4. Dormant plants are hardy to about -25°C[187]. The young growing in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This is a commonly cultivated food crop in Japan, where it is grown for its edible shoots. There are several named varieties[2, 46, 58, 116]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.2.64 *Malva neglecta*

Dwarf Mallow, Common mallow

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Malva neglecta* is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Egg TeaLeaves and young shoots - raw or cooked[2, 9, 13, 74, 85]. A mild pleasant flavour[K], they are said to be highly nutritious[222]. They can be added in quantity to salads, and make an excellent lettuce substitute, they can also be cooked as greens[183, K]. The leaves are mucilaginous, when cooked in soups etc they tend to thicken it in much the same way as okra (*Abelmoschatus esculenta*)[222]. Some people find this mucilaginous texture unpleasant, especially if the leaves are cooked[K]. Immature seeds - raw or cooked[74, 85, 183]. A pleasant nutty flavour, they are nice as a nibble but too small for most people to want to collect in quantity[K]. A decoction of the roots is used as an egg-white substitute for making meringue[183]. The roots are brought to the boil in water and then simmered until the water becomes quite thick. This liquid can then be whisked in much the same way as egg whites[K]. A tea can be made from the dried leaves[85, 183].

tcanta Dye TeethCream, yellow and green dyes can be obtained from the plant and the seed heads[168]. The root is used as a toothbrush[74].

dwatta Antinflammatory Antiphlogistic Astringent Demulcent Diuretic Emollient Expectorant Laxative Poulitice Purgative Salve UrinaryAll parts of the plant are antiphlogistic, astringent, demulcent, diuretic, emollient, expectorant, laxative, salve[9, 222, 238]. The leaves and flowers can be eaten as part of the diet, or a tea can be made from the leaves, flowers or roots[222]. The leaves and flowers are the main part used, their demulcent properties making them valuable as a poultice for bruise, inflammations, insect bites etc, or taken internally in the treatment of respiratory system diseases or inflammation of the digestive or urinary systems[222, 238]. They have similar properties, but are considered to be inferior to the marsh mallow (*Althaea officinalis*), though they are stronger acting than the common mallow (*M. sylvestris*). They are seldom used internally[4]. The plant is an excellent laxative for young children[7].

propta Seed - sow early spring or autumn in situ. Germination should take place within 2 weeks. The seed germinates in the autumn in the wild.

nwatta A very easily grown plant, succeeding in ordinary garden soil, though it prefers a reasonably well-drained and moderately fertile soil in a sunny position. It also succeeds in dry soils. At one time this plant was often cultivated for its edible leaves[2]. Plants seem to be immune to the predations of rabbits[233]. Prone to infestation by rust fungus.

## 5.2.65 *Crataegus acclivis*

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 8 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta *Crataegus acclivis* is a deciduous Tree growing to 8 m (26ft) by 7 m (23ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. The fruit ripens in early September, it is about 18mm long with a pleasantly sweet juicy flesh and makes an excellent dessert fruit[K]. The fruit contains up to 5 seeds in the centre, these usually stick together and so the effect is like eating a cherry with its single large seed[K].

tcanta None known

dwatta Cardiac HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Plants are hardy to at least -18°C[202]. We have very little specific information on this plant, and it is regarded as no more than a form of *C. pedicellata* by most botanists[235]. However, a tree seen at Kew in early September 1997 had a good crop of almost ripe fruit. This fruit was more elongated than *C. pedicellata* and was also ripe about 4 weeks before that species[K]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.66 *Amelanchier canadensis*

Juneberry, Canadian serviceberry, Serviceberry Downy, Shadblow, Shadbush, Serviceberry  
4 tlin 7 cyuc 4 kcaak 4 tcan 1 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta *Amelanchier canadensis* is a deciduous Shrub growing to 6 m (19ft) by 3 m (9ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid

## 5.2.130 *Morus alba*

White Mulberry, Common Mulberry,

4 tlin 9 cyuc 4 kcaak 4 tcan 3 dwat 18 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Morus alba* is a deciduous Tree growing to 18 m (59ft) by 10 m (32ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit Inner bark Leaves Manna ShrubEdible Uses: TeaFruit - raw[2, 7, 158]. A sweet taste, but the fruit is usually insipid[3, 11]. It contains about 1.5% protein, 0.5% fat, 8% carbohydrate, 0.7% malic acid[179]. Fruits of the cultivar 'Pendulum' tried at Kew in July 1994 had a pleasant flavour[K]. A richer flavour develops if the fruit is dried, it can then be used as a raisin substitute. The fruit is up to 25mm long[200]. Some caution is advised, see the notes above on toxicity. Per 100 g, the fruit is reported to contain 87.5 g water, 1.5 g protein, 0.49 g fat, 8.3 g carbohydrates, 1.4 g fiber, 0.9 g ash, 80 mg Ca, 40 mg P, 1.9 mg Fe, 174 IU vit. A, 9.7g thiamine, 184 µg riboflavin, 0.8 mg nicotinic acid, and 13 mg ascorbic acid. Young leaves and shoots - cooked[105, 183]. A famine food, used when all else fails[177]. The leaf makes a good vegetable, it is rich in carotene and calcium[179]. Protein preparations from young mulberry leaves form an excellent supplement to protein-deficient diets[269]. The dry leaves contain 18 - 28.8% protein, 0.2 - 0.7% Magnesium, 0.8 - 13.6% soluble sugars, 0.6 - 1.4% phosphorus, 2 - 3.9% potassium, 1.4 - 2.4% calcium, 0.8 - 1.8% aluminium, 0.05 - 0.26% iron, 1.8 - 2.6% silica, and 0.3 - 0.56% sulphur[269]. The leaf also contains 10% tannin[179]. Inner bark - roasted and ground into a meal then used as a thickener in soups etc or mixed with cereals when making bread. A famine food, used when all else fails[179]. The tree is said to be a source of an edible manna[183]. Young shoots can be used as a tea substitute[183].

tcanta Biomass Dye Fibre Fodder Shelterbelt Tannin WoodA fibre is obtained from the bark of one-year old stems, it is used in weaving clothes etc[7, 74, 266]. The stem bark is fibrous and is used in China and Europe for paper making[266, 269]. The twigs are used as binding material and for making baskets[269]. A brown dye is obtained from the trunk[178]. The leaves contain 10% tannin[179]. This tree can be grown as a part of a shelterbelt. The cultivar 'Tartarica' has been especially mentioned[200], it is very suitable for northern latitudes and is much used as a shelterbelt in Russia[269]. The wood of the mulberry is a potentially excellent source of ethanol, with yields of up to 6% from sawdust treated with acid and then given four days incubation[269]. Wood - light to moderately heavy, hard, durable, fine and close-grained, though it shows a tendency to warp. Due to its elasticity and flexibility when steamed, it is valued for making sports equipment such as tennis rackets and cricket bats, being considered as good as ash (*Fraxinus excelsior*)[238, 269]. It is also used for boat building, furniture, agricultural implements etc[145, 149, 158, 269]. It furnishes a medium grade fuel wood[269].

dwatta Analgesic Anthelmintic Antiasthmatic Antibacterial Antirheumatic Antitussive Astringent Diaphoretic Diuretic Emollient Expectorant Hypoglycaemic Hypotensive Odontalgic Ophthalmic Pectoral Purgative Sedative Tonic UrinaryThe white mulberry has a long history of medicinal use in Chinese medicine, almost all parts of the plant are used in one way or another[238]. Recent research has shown improvements in elephantiasis when treated with leaf extract injections and in tetanus following oral doses of the sap mixed with sugar[238]. The leaves are antibacterial, astringent, diaphoretic, hypoglycaemic, odontalgic and ophthalmic[176, 218, 238]. They are taken internally in the treatment of colds, influenza, eye infections and nose-bleeds[176, 238]. An injected extract of the leaves can be used in the treatment of elephantiasis and purulent fistulae[176]. The leaves are collected after the first frosts of au-

tumn and can be used fresh but are generally dried[238]. The stems are antirheumatic, antispasmodic, diuretic, hypotensive and pectoral[176, 218, 238]. They are used in the treatment of rheumatic pains and spasms, especially of the upper half of the body, high blood pressure[176]. A tincture of the bark is used to relieve toothache[7]. The branches are harvested in late spring or early summer and are dried for later use[238]. The fruit has a tonic effect on kidney energy[218, 238]. It is used in the treatment of urinary incontinence, dizziness, tinnitus, insomnia due to anaemia, neurasthenia, hypertension, diabetes, premature greying of the hair and constipation in the elderly[176, 238]. The root bark is antiasthmatic, antitussive, diuretic, expectorant, hypotensive and sedative[176, 238]. It is used internally in the treatment of asthma, coughs, bronchitis, oedema, hypertension and diabetes[176, 238]. The roots are harvested in the winter and dried for later use[238]. The bark is anthelmintic and purgative, it is used to expel tape worms[240]. Extracts of the plant have antibacterial and fungicidal activity[218].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Agroforestry Services: Contour hedgerow Agroforestry Services: Living fence Fodder: Bank Fodder: Insect Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Other Systems: Dyke-pond/Landscape Uses:Pest tolerant, Aggressive surface roots possible, Pollard. Succeeds in a variety of soils[269], though it prefers a warm well-drained loamy soil in a sunny position[1, 11]. Plants are fairly wind-resistant[200], though the branches are often killed back when growing in strong maritime exposure[K]. At least some cultivars are drought resistant, the form 'Tatarica' has been especially mentioned[183]. The white mulberry is occasionally cultivated for its edible fruit, there are a number of varieties[183] and sub-species varying greatly in the quality of their fruit. The form *M. alba multicaulis* (Perretot/Loud, (synonym *M. multicaulis*, Perretot.) has been specially mentioned for its fruit[105]. The cultivars 'Nana' and 'Feggyvernekiana' are dwarf forms only making shrub size[182]. The cultivar 'Pendulum' was seen growing at Kew in July 1994 with a heavy crop of tasty fruits, the first of which were just ripening[K]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. This is a good tree for growing grapes into[20]. The grapes are difficult to pick but always seem to be healthier and free from fungal diseases[201]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Naturalizing, There are no flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

Tolerates exposed positions and atmospheric pollution[200]. A very ornamental and fast-growing tree[1, 4], it succeeds in most areas of Britain but grows best in eastern and south-eastern England[200]. Trees are very hardy when dormant, but the young growth in spring can be damaged by late frosts. The flowers have a delicate honey-like perfume[245]. Trees are tolerant of drastic cutting back and can be severely lopped[200]. They are prone to suddenly losing old heavy branches[98]. The tree comes into bearing within 20 years from seed[98]. Most members of this genus transplant easily, even when fairly large[11]. Special Features: Attractive foliage, Not North American native, Naturalizing, Blooms are very showy. Carbon Farming Solutions - Cultivation: hypothetical. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.128 Crataegus submollis

Quebec Hawthorn

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 7 m hkuc hmimhtut cyutli hgtaccuphja7n hwicli hrasjlutnykfrip hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Crataegus submollis is a deciduous Tree growing to 7 m (23ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 161]. Sub-acid, dry and mealy[82]. Our experience has been that the fruit is sweet and somewhat juicy, it has a thick flesh with a nice flavour and makes an acceptable dessert fruit[K]. The fruit can also be used in making pies, preserves etc, and can be dried for later use[257]. It is about 20mm in diameter, is borne in large clusters and is easily harvested[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Hedge HedgePlants are very tolerant of trimming and will soon resprout even if cut back into very old wood. They can be used as a hedge[50]. Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow

them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Plants are hardy to about -18°C[202]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. This species is sometimes confused with *C. coccinea*[50]. It is also very close to *C. mollis*, differing in having 10 stamens to a flower (as compared to 20 in *C. mollis*)[202]. It is considered to be part of *C. mollis* by some botanists[229].

## 5.2.129 Dichelostemma pulchellum

Wild Hyacinth

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli kyuctup hwicli hraslut hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Dichelostemma pulchellum is a CORM growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Corm - raw or cooked[22, 61, 161, 183]. A sweet flavour[46], it may seem rather flat at first, but the taste quickly grows on one[95]. A slow baking develops the sweetness of the corm[95]. The corm can be dried and ground into a powder then used as a thickener in soups or mixed with cereal flours to make bread etc[257]. The corm is usually harvested in the spring[257]. Flowers - raw[257]. A nice decoration in the salad bowl[183].

tcanta AdhesiveThe corms have been rubbed on metate into an adhesive and then spread on baskets to close the interstices and prevent small seeds falling through the gaps[257].

dwatta None known

propta Seed - best sown as soon as it is ripe in a free-draining compost in a cold frame[200]. Sow stored seed in spring in a cold frame[175]. Seedlings are prone to damping off and so should be kept well ventilated[175]. Germinates in 1 - 3 months at 15°C[175]. If the seed is sown thinly enough, it can be grown on for its first year without transplanting and then the dormant bulbs can be planted 2/3 to a pot. Otherwise prick out the seedlings when large enough to handle, planting them 2/3 to a pot. Grow on the plants in a greenhouse for at least two years before planting out in late spring after the last expected frosts. Division in autumn of offsets that have reached flowering size[1]. Dig up the clumps of bulbs and replant the larger ones into their permanent positions. It is best to pot up the smaller ones and grow them on for a year in a cold frame before planting them out.

nwatta Easily grown in a well-drained rich sandy loam[1], it likes plenty of moisture whilst in growth followed by a warm dry period in late summer to autumn in order to fully ripen its bulb[200]. Plants are susceptible to rot in wet soils[200]. This species is hardy to between -5 to -10°C, it may require protection in severe winters[90]. This can be done by applying a good organic mulch such as dry bracken in late autumn and removing it in early spring. Alternatively, you can cover the ground with a cloche or other device. A very ornamental plant, it can flower in 2 years from seed.

and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[3, 55, 101, 159]. The fruit contains a few small seeds at the centre, it has a sweet flavour with a hint of apple[1, 2]. It can be eaten out of hand, used in pies, preserves etc or dried and used like raisins[183]. We have found the fruit to be of variable quality, with some forms having a distinct bitterness in the flavour whilst others are sweet, juicy and delicious[K]. When the fruit is thoroughly cooked in puddings or pies the seed imparts an almond flavour to the food[183]. The fruit is rich in iron and copper[226]. It is about 10mm in diameter[200]. Trees can yield 7 to 15 tonnes per hectare[160].

tcanta Disinfectant Hedge Hedge Rootstock Shelterbelt WoodThis species can be used as a dwarfing rootstock for Malus spp. (the apples) and Pyrus spp. (the pears)[160]. Plants can be grown as an informal hedge[200]. Any trimming is best done after flowering[200]. A fairly wind-tolerant species, it can be used to give protection from the wind as part of a mixed shelterbelt[200]. Wood - hard, strong, close grained. Used for tool handles, small implements etc[46, 61].

dwatta Anthelmintic Disinfectant Women's complaintsA tea made from the root bark (mixed with other unspecified herbs) was used as a tonic in the treatment of excessive menstrual bleeding and also to treat diarrhoea[222, 257]. A bath of the bark tea was used on children with worms[222, 257]. An infusion of the root was used to prevent miscarriage after an injury[257]. A compound concoction of the inner bark was used as a disinfectant wash[257].

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Landscape Uses:Specimen, Woodland garden. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not water-logged, too dry or poor[11], though it is more wet-tolerant than other members of this genus[11]. Grows well in heavy clay soils. Prefers an acid soil[17, 43]. Trees produce more and better quality fruits better when growing in a sunny position[1]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. There is at least one named variety of this species with superior fruits. 'Prince William' is a large multi-stemmed shrub to 3 metres tall and 2 metres across[183, 200]. It crops heavily and its good quality fruit is about 12mm in diameter[183]. Considerable confusion has existed between this species and *A. arborea*, *A. laevis* and *A. lamarckii*, see [11] for the most recent (1991) classification. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:Attracts birds, North American native, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or

more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 5.2.67 Ribes burejense

Bureja gooseberry,

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Ribes burejense is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. Acid but palatable, it is a gooseberry and can hang on the bush until November if the birds leave it alone[K]. At this time of year it develops a rather nice black-currant flavour[K]. The fruit is about 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 2 to 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter; planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Quite tolerant of shade though not fruiting so well in such a position[11]. Hardy to about -20°C[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.68 Valerianella locusta

Corn Salad, Lewiston cornsalad

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli kyuctup hwicli hrasjlutnyk hpa7tli flatprikwlis hpa7tmwatli fyfjxre7t hjonli

drutta Valerianella locusta is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young leaves - raw[1, 2, 4, 5, 12, 27, 33, 37]. A very mild flavour, with a delicate quality that makes them seem to melt in the mouth, they can be added in quantity to salads[183]. The leaves can be available all year round from successional sowings and will only require protection in the colder winters[K]. Flowers and flowering stems - raw[183].

tcanta None known

dwatta None known

propta Seed - in order to obtain a continuous supply of salad leaves, it is best to sow the seed successively from early spring to late summer in situ. A late summer sowing might also succeed, and this would supply edible leaves in the winter.

nwatta A very easily grown plant, it prefers a fairly rich light soil[1, 37] though it tolerates moist soils and wet or dry conditions[52]. Prefers a sunny position but tolerates some shade in summer[K]. This shade, plus an adequate supply of water, will slow down the plant's tendency to run to seed[200]. Late sowings will benefit from a sheltered sunny position and perhaps some protection in the winter. Often cultivated on a garden scale for its edible young leaves which, by successional sowing, can be available for most of the year although they will require protection in severe winters. There are several named varieties[183]. The plants do tend to run quickly to seed in the summer though. If allowed to flower, plants will often maintain themselves by self-sowing[K].

## 5.2.69 Crataegus succulenta

Fleshy hawthorn  
4 tlin 8 cyuc 4 kcaak 2 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli hgatkuyctcuphja7n hwicli hrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli  
drutta Crataegus succulenta is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[62, 101, 105]. Excellent for making jellies[183], it can also be dried for later use. A small fruit with a sweet, juicy and pulpy flesh[82, 183], it is up to 17mm in diameter[235]. Another report says that the fruit is large for a Crataegus species, it is about 35mm in diameter and is borne in small clusters[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].  
dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively

moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. This species is closely related to *C. tomentosa*[11].

## 5.2.70 Helianthus hybrids

Perennial Sunflower  
4 tlin 11 cyuc 4 kcaak 2 tcan 2 dwat 3.6 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyk hpa7tli flatprikliwis hpa7tmwatli hjonli  
drutta Helianthus hybrids is a PERENNIAL growing to 3.6 m (11ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 10. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Oil Seed StemEdible Uses: Drink OilCarbon Farming Solutions - Staple Crop: protein-oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. Perennial crops are being developed for their oil-seed. The Land Institute see them as part of a perennial polyculture system [1-1].  
tcanta Biomass OilSee individual species. Some sunflowers are a good source of biomass. The tubers are used in industry to make alcohol etc[141]. The alcohol fermented from the tubers is said to be of better quality than that from sugar beets[269]. Can be grown as a temporary summer screen[200]. Ornamental. A food plants for the larvae of many lepidopterans.

dwatta Various medicinal qualities depending on the species.

propta See individual species.  
nwatta Management: Standard Staple Crop: Protein-oil Under DevelopmentClimate: boreal to warm temperate. Humidity: semi-arid to humid. Carbon Farming Solutions - Cultivation: under development. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1]. Perennial crops are being developed for their oil-seed. The Land Institute see them as part of a perennial polyculture system [1-1]. Several perennial sunflowers are being worked with including prairie natives handling boreal to warm temperate semi-arid conditions: Helianthus maximliani (Maximilian sunflower), Helianthus tuberosus (Jerusalem artichoke), Helianthus pauciflorus (Stiff sunflower). Less tolerant of boreal conditions but good on poor soils is Helianthus cusickii (Cusick's sunflower) [1-1].

## 5.2.71 Akebia x pentaphylla

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 9 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Akebia x pentaphylla is a deciduous Climber growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

necessary (eat the thinnings) and transplant the young plants into their final positions in the following spring. Prick out the pot-grown seedlings into individual pots when they are large enough to handle and plant them out in spring. Division in spring or autumn. Remove the tapering tap root and cut the remaining root into sections with at least one eye per section and replant in their permanent position.

nwatta Prefers a moist rich soil in a shady position[14, 52, 200]. Thrives in all soils[1] in sun or shade[111, 200]. This species is hardy to about -15°c according to one report[200] whilst another says that it is hardy to at least -20°c[187]. Plants often self-sow freely[200]. Sweet cicely used to be quite widely cultivated as a food plant but is now only occasionally grown in the herb garden. This is a shame since it is an extremely useful and tasty plant to grow and can provide food all year round[K]. A good bee plant[4]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.126 Hemerocallis thunbergii

4 tlin 8 cyuc 4 kcaak 2 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis thunbergii is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves and young shoots - cooked[205]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds- raw or cooked[105, 177]. The flowers can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Attractive Flowers.  
dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. Plants take a year or two to become established after being moved[200]. They increase by means of runners[205] and form loose spreading clumps[K]. The roots are

not swollen[233]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. The fragrant flowers are very short-lived, they open in the late afternoon and die in the morning[200, 205]. However, plants produce a succession of flowers for several weeks of the summer, each scape carrying between 4 and 20 blooms[205].

## 5.2.127 Aesculus spp

Horse chestnut  
4 tlin 9 cyuc 4 kcaak 4 tcan 4 dwat 30 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Aesculus spp is a deciduous Tree growing to 30 m (98ft) by 25 m (82ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: The roasted seed is used as a coffee substitute[2, 7]. Seed - cooked. It can be dried, ground into a powder and used as a gruel[7, 46, 55, 61]. The seed is quite large, about 3cm in diameter, and is easily harvested. It is usually produced in abundance in Britain. Unfortunately the seed is also rich in saponins, these must be removed before it can be used as a food and this process also removes many of the minerals and vitamins, leaving behind mainly starch. See also the notes above on toxicity. The seed contains up to 40% water; 8 - 11% protein and 8 - 26% toxic saponins[218]. The following notes apply to A. californica, but are probably also relevant here:- The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213].

tcanta Saponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. The seed contains variable amounts of saponins, up to a maximum of 10%[240]. A starch obtained from the seed is used in laundering[100]. The bark and other parts of the plant contain tannin, but the quantities are not given[223]. A yellow dye is obtained from the bark[4]. The flowers contain the dyestuff quercetin[223]. Wood - soft, light, not durable. Of little commercial value, it is used for furniture, boxes, charcoal[2, 11, 46, 61]. Carbon Farming Solutions - Industrial Crop: starch, medicinal (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1].

dwatta Various medicinal qualities depending on the species. They include: Alternative; Analgesic; Antiinflammatory; Antirheumatic; Astringent; Bach; Diuretic; Expecto-rant; Fibrifuge; Haemostatic; Narcotic; Tonic; Vasoconstrictor; Vulnerary.

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Hypothetical Crop Industrial Crop: Medicinal Industrial Crop: Starch Management: StandardClimate: cold to warm temperate, Mediterranean.Humidity: semi-arid to humid. Landscape Uses: Firewood, Pollard, Specimen, Street tree. Prefers a deep loamy well-drained soil but is not too fussy tolerating poorer drier soils[11, 200].



drutta *Ribes rubrum* is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 2, 5, 11]. A pleasant acid flavour, it can be eaten out of hand but is more often cooked in pies, jams etc[K]. There are rather a lot of seeds in each fruit[K].

tcanta Cosmetic DyeA yellow dye is obtained from the leaves[100]. A black dye is obtained from the fruit[100]. The fruit is used cosmetically in face-masks for firming up tired and lifeless skin[7].

dwatta Antirheumatic Antiscorbuc Apertient Poulitce Refrigerant SialagogueThe fruit is antiscorbuc, apertient, depurative, digestive, diuretic, laxative, refrigerant and sialagogue[4, 7, 21]. The leaves contain the toxin hydrogen cyanide[240]. A concoction of them is used externally to relieve rheumatic symptoms[7]. They are also used in poultices to relieve sprains or reduce the pain of dislocations[7].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade, even succeeding on a north-facing wall[200], though they do not fruit so well in such a position[11]. Prefers a pH in the range 5.5 to 6[200]. Hardy to about -20°C[200]. Red currants are often cultivated in temperate zones for their edible fruit, there are some named varieties, including forms with white fruits[4, 61]. Most cultivars are self-fertile and set a good crop on their own[200]. The fruit is produced at the base of one-year old and older wood, plants start to fruit at 3 - 4 years from seed[200]. This is an aggregate species comprising *R. spicatum* and *R. rubrum*. There is some confusion in nomenclature with some botanists only recognising 2 species, *R. silvestre*. (syn *R. sativum*) and *R. spicatum* (syn *R. rubrum*)[17, 200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 5.2.124 Pyrus bretschneideri

4 tlin 8 cyuc 4 kcak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli hgattcup hwicli hrasljutnykfrip hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta *Pyrus bretschneideri* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177, 200]. The fruit is up to 3cm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. This species is closely related to *P. ussuriensis ovoidea*[200]. This species is commonly cultivated in northern China, preferring sunny, dry, loamy soils. It includes many important forms with excellent fruit[266]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 5.2.125 Myrrhis odorata

Sweet Cicely, Anise

4 tlin 8 cyuc 4 kcak 3 tcan 3 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfuxre7t hjonli

drutta *Myrrhis odorata* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: TeaLeaves - raw or cooked[2, 5, 37, 52]. Excellent raw, the leaves have a delicious sweet aniseed flavour[9] and are liked by the majority of people who try them[K]. They are also used as a flavouring for vegetables[183], and are an important ingredient of the herb mix 'bouquet garni'[244]. They can be cooked with tart fruits in order to reduce their acidity[14, 183]. The plant produces fresh leaves from late winter to early the following winter[200]. The leaves can also be dried for later use[21]. It is best to prevent the plant from flowering if the leaves are required for culinary use, because they lose their flavour when the plant is in flower[244]. Root - raw or cooked[1, 2, 5, 14, 37]. A similar flavour to the leaves[K]. So long as it is not too old, the root can be boiled and mixed with other vegetables or added to salads[9]. Seed - raw or cooked[1, 2, 183]. An aniseed flavour, it is usually used as a flavouring[14, 115] but can also be eaten raw whilst it is still green and before the fibrous coat has formed[1, 9]. It makes an excellent mouth freshener[K]. A tea is made from the leaves[183].

tcanta PolishThe leaves and the seed make good polishes for wood[4, 6, 115]. You just rub them over the wood and then rub the wood with a clean cloth to remove any greenness. It is particularly good on oak panels[5], giving a lovely glossy finish and an aromatic smell[244]. Invertebrate shelter, Nectary. Aromatic.

dwatta Antiseptic Aromatic Carminative Expectorant StomachicThe whole plant, including the seed, is aromatic, carminative, expectorant and stomachic[4]. It is useful in the treatment of coughs and flatulence, and also as a gentle stimulant for the stomach[4, 238]. The root is antiseptic and a decoction has been used to treat snake and dog bites[4, 244]. An ointment made from the roots has been used to ease gout and soothe wounds[244].

propta Seed - best sown as soon as it is ripe since stored seed is difficult to germinate[1]. The seed can be sown in an outdoor seedbed or, if supplies are limited, it can be sown in pots in a cold frame. Thin the seedlings in the outdoor bed as

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw[200]. Sweet but insipid. The fruit has a delicate flavour and a soft juicy texture[K]. The flavour can be enhanced by the addition of a little lemon juice. Valued as a novelty, it looks somewhat like a deep-purpl coloured sausage. The dried young leaves are a tea substitute.

tcanta BasketryThe peeled stems are very pliable. They can be bleached and used in basket making[46, 61].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Surface sow in a light position[133]. The seed usually germinates in 1 - 3 months at 15°C[133]. Stored seed should be given 1 month cold stratification[113, 133] and can be very difficult to germinate. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. This is a hybrid species and so it will not breed true from seed. Cuttings of half-ripe wood, July/August in a frame[11, 113]. The cuttings can be slow to root[200]. Cuttings can also be taken of soft wood in spring[113]. Root cuttings, December in a warm greenhouse[113]. Layering in early spring[1]. Very easy, the plants usually self-layer and so all you need to do is dig up the new plants and plant them out directly into their permanent positions.

nwatta Requires a well-drained moisture retentive soil[200]. Succeeds in acid or alkaline soils[200]. Prefers partial shade but succeeds in full sun[200]. Succeeds on a north facing wall[219]. Dormant plants are hardy to about -15°C but they can be somewhat tender when young and are best given some protection at this time[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Resentful of root disturbance, either grow plants in containers prior to planting them out or plant them out whilst very young[219]. A naturally occurring hybrid, *A. quinata* x *A. trifoliata*[200]. Plants are evergreen in mild winters[11, 200]. They are fast growing and can be invasive[200]. Plants are not normally pruned, if they are growing too large they can be cut back by trimming them with shears in early spring[202]. Shy to fruit, it possibly requires some protection in the flowering season - hand pollination is advisable. Plants are also possibly self-sterile. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.72 Quercus prinus

Rock Chestnut Oak

4 tlin 8 cyuc 4 kcak 3 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Quercus prinus* is a deciduous Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[2, 46, 83, 159]. Somewhat sweet according to some reports[62, 82, 95, 229, 235] whilst another says that it contains bitter tannin[183]. The seed is quite large, up to 4cm long and 25mm wide[82, 200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. If the seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Buttons Dye Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. The seed cups are used as buttons[95]. The bark is a commercial source of tannin[46, 223]. On a 10% moisture basis, the bark contains 9.7% tannin[223]. Tannin is also found in the leaves and wood[223]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A red dye is obtained from the bark[4]. Tan-coloured according to another report[257]. Wood - close-grained, heavy, hard, rather tough, strong, durable in contact with the soil[46, 61, 82, 229]. It weighs 47lb per cubic foot[235]. Used commercially like *Q. alba*, it is used for furniture, cabinet making, interior finishes, fence posts and fuel[46, 61, 229].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain[200], but trees still grow well in this country[1]. A slow-growing tree in the wild, though it can live 400 years[229]. The tree produces large crops of acorns every 4 - 7 years, with small crops in the intervening years[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. This species is often confused with *Q. michauxii*, *Q. muehlenbergii* and *Q. prinoides*[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200]. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.73 Rhus copallina

Dwarf Sumach, Winged sumac, Flameleaf Sumac, Winged Sumac, Shining Sumac

4 tlin 10 cyuc 4 kcak 3 tcan 2 dwat 2 m hkuc htut cyutli hgatkyuctup hwicli hyishrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli nyanhjen hjonli

drutta *Rhus copallina* is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must

be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Fruit Oil**Edible Uses:** Drink OilFruit - raw or cooked[22, 46, 161]. An agreeable acid flavour[2]. The fruit is only 3 - 5mm long with very little flesh, but it is borne on dense panicles and is thus easily harvested[229]. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[95, 105, 149, 159, 183]. The mixture should not be boiled since this will release tannic acids and make the drink astringent.

**tcanta Dye Hedge Hedge Mordant Oil Resin Soil stabilization Tannin Vernish Wood**The leaves are rich in tannin[46, 82, 169], so is the bark[149] and the fruit[169]. The leaves can be collected as they fall in the autumn and used as a brown dye or as a mordant[169, 171]. The leaves contain 10 - 25% tannin[171]. Up to 35.8% has been obtained from some plants[223]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The plants extensive root system makes it useful for stabilizing soils. A black dye is obtained from the fruit[149, 257]. A resin, 'copal resin', is obtained from the sap of this plant. When dissolved in any volatile liquid, such as oil of turpentine, it makes a beautiful varnish[4]. (Is this a mistaken entry? Perhaps it belongs with one of the toxic species[K]). Wood - light, soft, coarse grained[82]. It weighs 32lb per cubic foot[227]. Sometimes used for small posts[149].

**dwatta Astringent Dysentery Enuresis Galactogogue Poultrice SalveA** decoction of the root has been used in the treatment of dysentery[222]. An infusion of the roots has been used in the treatment of VD[257]. A poultice of the root has been applied to sores and skin eruptions[257]. A tea made from the bark has been drunk to stimulate milk flow in nursing mothers. A decoction of the bark has been used as a wash for blisters and sunburn blisters[222, 257]. An infusion of the leaves has been used to cleanse and purify skin eruptions[257]. The berries were chewed in the treatment of bed-wetting and mouth sores[222, 257]. Some caution is advised in the use of the leaves and stems of this plant, see the notes above on toxicity.

**propta Seed** - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

**nwatta Experimental Crop Industrial Crop: Dye Industrial Crop: Hydrocarbon Industrial Crop: Tannin Management: CoppiceLandscape Uses:Border, Erosion control, Pest tolerant, Massing, Specimen.** Succeeds in a well-drained fertile soil in full sun[11, 200]. Tolerates poor soils[169, 200]. Established plants are drought resistant[169]. A very hardy species, when fully dormant it can tolerate temperatures down to about -25°C[200]. However, the young growth in spring can be damaged by late frosts. A very ornamental plant[1]. It is quite fast-growing but short-lived in the wild[229]. In the north of its range plants are dwarf, around 1.2 metres tall, but in the south they can be up to 7 metres tall[182]. Some botanists divide this species into separate species, whilst others see it as a single species with geographical forms. R. copallina is usually a shrub and is found in moist soils in sun or shade[227]. R. copallina lanceolata. Gray. is more tree-like and is found in drier soils[227]. Transplants easily[169]. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also

susceptible to coral spot fungus[11]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Attracts birds, North American native, Attracts butterflies, Attractive flowers or blooms. Carbon Farming - Cultivation: experimental. Management: coppice. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.74 Crataegus holmesiana

Holmes' hawthorn

4 tin 8 cyuc 4 kcaok 0 tcan 2 dwat 10 hkuc  
hmmhtut cyuti hgattcuphja7n hwicli hrsajlutnykfrp hpa7tli  
flatprikhwisslip hpa7tmwatli xre7t hjonli

**drutta** Crataegus holmesiana is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. An excellent dessert fruit, it has an acid yet sweet flavour, is juicy but with a mealy texture, it makes very pleasant eating[K]. Some forms have fruits with a disagreeable flavour[82]. The fruit can also be used in making pies, preserves etc, and can be dried for later use. The fruit is about 10mm in diameter[200]. A specimen at Cambridge Botanical garden has fruits up to 20mm in diameter[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood** - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

**dwatta Cardiac Hypotensive**Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

**propta Seed** - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold

is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. Pipes are made from the young shoots and are used for drawing the sap of sugar maples (Acer spp)[82]. They are also used as flutes[159]. The plant has an extensive root system and is planted as a windbreak screen and to prevent soil erosion[200]. Wood - soft, light, brittle, coarse grained[82, 101]. It weighs 27lb per cubic foot[235]. Of no commercial value, though it is sometimes used as a rough construction wood or is employed in turning[226].

**dwatta Antihemorrhoidal Antiseptic Astringent Blood purifier Diuretic Emetic Galactogogue Poultrice Stomachic Tonic VD** WartsStag's horn sumach was often employed medicinally by several native North American Indian tribes who valued it especially for its astringent qualities[257]. It is little used in modern herbalism. Some caution is advised in the use of the leaves and stems of this plant, see the notes above on toxicity. The bark is antiseptic, astringent, galactogogue and tonic[222, 257]. An infusion is used in the treatment of diarrhoea, fevers, piles, general debility, uterine prolapse etc[213, 222]. An infusion is also said to greatly increase the milk flow of a nursing mother - small pieces of the wood were also eaten for this purpose[257]. The inner bark is said to be a valuable remedy for piles[257]. The roots are astringent, blood purifier, diuretic and emetic[222]. An infusion of the roots, combined with purple coneflower (Echinacea purpurea) has been used in the treatment of venereal disease[257]. A poultice of the roots has been used to treat boils[257]. The leaves are astringent. They have been used in the treatment of asthma, diarrhoea and stomatitis[222]. An infusion of the fruits has been used as a tonic to improve the appetite and as a treatment for diarrhoea[257]. The berries are astringent and blood purifier[257]. They were chewed as a remedy for bed-wetting[222, 257]. A tea made from the berries has been used to treat sore throats[213]. The flowers are astringent and stomachic. An infusion has been used to treat stomach pains[257]. The sap has been applied externally as a treatment of warts[226]. Some caution is advised here since the sap can cause a rash on many people[K].

**propta Seed** - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

**nwatta Landscape Uses:**Border, Massing, Specimen. Succeeds in a well-drained fertile soil in full sun[11, 200]. Tolerates poor soils[169, 200]. Succeeds in dry soils and is drought resistant once it is established[169]. A fairly wind hardy plant, though the branches are brittle and can be broken off in very high winds[200, K]. A very hardy plant, when fully dormant it can tolerate temperatures down to at least -25°C[200]. However, the young growth in spring can be damaged by late frosts. A fast growing but short-lived tree[159], it can sucker freely, forming thickets and becoming quite anti-social when grown in small areas[11]. Single-stem plants are short-lived in cultivation, but if the plants are coppiced regularly and allowed to form thickets, then they will live longer and also be more ornamental with larger leaves[238]. Any coppicing is best carried out in early spring[238]. A very ornamental plant, there are some named varieties[182]. It is susceptible to coral spot fungus[11] but is notably resistant to honey fungus[88, 200]. It transplants easily[169]. This is a very good bee plant, the flowers producing an abundance of pollen and nectar[226]. There is some doubt over the validity of this name and the earlier R. hirta. [L.] has been proposed as the correct name. However, it seems likely that R. typhina will be retained because it is so well known[214]. This species is closely related to and hybridizes with R. glabra[101]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this

one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Attracts birds, North American native, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.122 Hemerocallis yezoensis

4 tin 8 cyuc 4 kcaok 0 tcan 1 dwat 0.8 m hkuc  
hmmhtut cyuti kyuctcup hwicli hrsajlutnykfrp hpa7tli flat-  
prikhlwis hpa7tmwatli xre7t hjonli

**drutta** Hemerocallis yezoensis is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Leaves**Edible Uses:** Leaves and young shoots - cooked[105, 177]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[205]. The flowers can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205].

**tcanta Weaving**The tough dried foliage is plaited into cord and used for making footwear[205].

**dwatta Antidote Diuretic Vitamin C**The juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

**propta Seed** - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. A very cold-hardy plant, tolerating temperatures down to about -25°C[187]. The roots are slender and not swollen[187]. The scapes carry between 4 and 12 blooms[205]. Hybridizes freely with other members of this genus[200]. It is closely related to H. vespertina Hara.[58]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

## 5.2.123 Ribes rubrum

Red Currant, Cultivated currant  
4 tin 8 cyuc 4 kcaok 2 tcan 1 dwat 1.2 m hkuc  
hmmhtut cyuti tcup hwicli hrsajlutnyk hpa7tli flatprikhlwis  
hpa7tmwatli fyfkrx7t hjonli

habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.120 Quercus bicolor

Swamp White Oak

4 tin 8 cyuc 4 kcaak 3 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcuphja7n hwicli jlutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Quercus bicolor is a deciduous Tree growing to 25 m (82ft 0in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[105, 161, 226]. A rather sweet flavour[159, 235]. The seed is quite large, about 2 - 3cm long and 15 - 20mm wide[82, 200], and unlike most other oaks, is attached to the tree by a long stem[183]. It matures in its first year[235]. The seed can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. The seed from some trees can contain bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. Roasted seed is a coffee substitute.

tcanta Repellent Rust Tannin WoodThe leaves of most species in this genus are more or less rich in tannins. A mulch of the leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc. Fresh leaves should be used with caution, since these can utilize some of the nitrogen in the soil and this inhibit plant growth[20, K ]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4 ]. The bark has been boiled with hemlock (Tsuga sp.?) and soft maple bark (Acer spp), and the liquid used to remove rust. The mixture was also believed to prevent rust[257 ]. The wood is close-grained, strong, hard, tough, heavy[46, 82, 171, 229 ]. It weighs 48lb per cubic foot[235 ]. Trees do not self-prune and dead branches remain on the trees for many years. This does mean that the wood is usually quite knotty[236 ]. The wood machines well, though it can check and warp if not dried properly. It is of some importance commercially. And is used for construction, cabinet making, furniture, interior finishes, veneers, fence posts etc[6, 82, 171, 229, 338, 1050 ]. The wood makes a good fuel.

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Pest tolerant, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A relatively fast-growing tree in the wild, living 300 - 350 years[229], though it is relatively shallow-rooted and is considerably more susceptible to forest fires than most other oaks[226]. This species is one of the best of the white oaks for growing in this country[1]. However, it is said that the seed is rarely formed in Britain[105]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Trees do not commence bearing until about 25 - 30 years old, large crops being produced every 3 - 5 years[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. The seed of this species is attached to the tree by unusually long (by oak tree standards) stems[183]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Attracts butterflies, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 5.2.121 Rhus typhina

Stag's Horn Sumach, Velvet Sumac, Staghorn Sumac

4 tin 8 cyuc 4 kcaak 3 tcan 2 dwat 6 m hkuc htut cyutli hgatyuctcup hwicli hyhisrasjlyutnyik hpa7tli flat-prikliwis hpa7tmwatli nyanhjen hjonli

drutta Rhus typhina is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from June to August, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit - cooked[22, 62]. A very sour flavour, they are used in pies[183]. The fruit is rather small and with very little flesh, but it is produced in quite large clusters and so is easily harvested. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[55, 85, 95, 101, 102, 183]. The mixture should not be boiled since this will release tannic acids and make the drink astringent.

tcanta Dye Hedge Hedge Ink Mordant Musical Oil Pipes Shelterbelt Soil stabilization Tannin WoodThe leaves are rich in tannin, up to 48% has been obtained in a controlled plantation[223]. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169, 171]. The bark, especially the root bark, and the fruits are also very rich in tannin[82, 159, 169]. A yellow dye can be obtained from the roots[257]. An orange dye can be obtained from the inner bark and central pith of the stem, mixed with bloodroot (Sanguinaria canadensis)[257]. A black ink can be made by boiling the leaves and the fruit[226]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and

stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hawthorns in general hybridize freely with other members of the genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant[11].

## 5.2.75 Sambucus caerulea

Blue Elder

4 tin 8 cyuc 4 kcaak 3 tcan 2 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlyutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Sambucus caerulea is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers FruitEdible Uses: TeaFruit - raw, cooked or used in preserves[2, 3, 15, 85, 94, 183, 257]. Rather sweet and juicy but full of small seeds[82, 256], this is the best flavoured of the North American elders[212]. The fruit is rather nice raw, seven people ate and enjoyed a small quantity of the raw fruit with no ill effects[K]. The fruit can be dried for later use[257]. A somewhat rank taste fresh[101], the fruit is usually dried before being used[183]. The fruit is about 6mm in diameter and is borne in large clusters[200]. Some caution is advised, see the notes above on toxicity. Flowers - raw or cooked in fritters etc[15, 85, 94, 183]. Very pleasant and refreshing raw[K]. A pleasant tea is made from the dried flowers[62, 183].

tcanta Musical Repellent Tinder WoodA decoction of the leaves, when watered on plants, repels caterpillars[94]. The dried flower stems repel insects and rodents[101]. The hollow stems can be used as flutes and pipes[257]. The pith of the stems has been used as a tinder for lighting fires[257]. Wood - light, soft, weak, coarse grained. Of no commercial value, though it is used locally for flutes, skewers, pegs, straws etc[82, 94, 99, 229].

dwatta Analgesic Antiseptic Astringent Diaphoretic Emetic Febrifuge Haemostatic Laxative Pectoral Salve Stomachic TonicHaemostatic[94]. An infusion or extract made

from the flowers, bark and root has been used to cure fevers and gripe, it is also laxative[226]. A decoction of the plant has been used as an antiseptic wash to treat itches[257]. The bark is analgesic and astringent[257]. An infusion has been used in the treatment of diarrhoea and rheumatism[257]. A decoction has been used as a wash in the treatment of swellings and pain[257]. An ointment made by mixing the bark with fat has been used externally in the treatment of burns, ulcers, skin irritations etc[226]. The fresh bark has been placed in a tooth cavity to ease the pain of toothache[257]. The inner bark is strongly emetic[257]. The leaves are analgesic, antiseptic, diaphoretic, febrifuge and purgative[257]. A decoction has been used in the treatment of new colds[257]. An infusion of the leaves and flowers has been used as a steam bath in the treatment of colds and headaches[257]. A decoction of the leaves has been used as an antiseptic wash on limbs affected by blood poisoning[257]. The crushed leaves have been used as a poultice to treat burns and swollen hands[257]. A decoction of the root has been used in the treatment of bladder problems and dyspepsia[257]. A decoction of the flowers has been used in the treatment of stomach troubles and lung complaints[257]. Applied externally, it has been used to treat sprains and bruises and as an antiseptic wash for open sores and itches[257]. A wine made from the fruit has been used as a tonic[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. A fast-growing but short-lived tree in the wild[229]. A shrub at Kew in September 1993 was carrying a good crop of tasty fruits[K]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.76 Allium senescens

German Garlic

4 tin 10 cyuc 4 kcaak 0 tcan 2 dwat 0.5 m hkuc htut cyutli hgatyuctcup hwicli hrasjlyut hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Allium senescens is a BULB growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[2, 46, 61, 105]. An onion substitute[22, 177]. The small bulbs are formed in clusters on a rhizome and are up to 10mm in diameter[200]. Leaves - raw or cooked[105, 177]. A fairly strong onion flavour with a slight bitterness, but acceptable raw[K]. We use them in salads or as a flavouring in cooked foods[K]. Flowers - raw or cooked. An attractive garnish in salads[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and

when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Landscape Uses:Alpine garden, Border, Container, Massing, Rock garden, Specimen. Prefers a sunny position in a light well-drained soil[1]. Established plants are fairly drought tolerant[190]. A very ornamental plant[42], it is frequently confused with *A. montanum*[1]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Fragrant foliage, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

## 5.2.77 Origanum vulgare

Origanum, Pot Marjoram

4 tlin 10 cyuc 4 kcaok 5 tcan 3 dwat 0.6 m hkuc hmimhtut cyuti kyuctcup hwicli hyishrasjltunyk hpa7tli flatprkikwis hpa7tmwatli xre7t hjonli

drutta Origanum vulgare is a PERENNIAL growing to 0.6 m (2ft) by 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves StemEdible Uses: Condiment TeaLeaves - raw or cooked as a potherb[5, 52, 183]. Origanum is an important flavouring herb in Mediterranean cookery, and is often used dried rather than fresh[238]. The leaves are used as a flavouring for salad dressings, vegetables and legumes, and are frequently included in strongly flavoured dishes with chillies, garlic, onions etc[2, 13, 21, 27, 183, 238]. A nutritional analysis is available[218]. Flowers, usually appear in late spring, are edible. Much of the commercially available dried oregano does not come from this plant but from a number of different, often unrelated plants[238]. These include *Lippia graveolens*, *L. palmeri* and *Origanum syriacum*[238]. A herb tea is made from the dried leaves and flowering stems[183, 207, 238].

tcanta Dye Essential Parasiticide Repellent StrewingAn essential oil from the plant is used as a food flavouring, in soaps and perfumery[115, 171]. The herb contains 0.15 - 0.4% essential oil[218] and makes good herbal pillows and baths[244]. The plant was formerly used as a strewing herb[201]. The essential oil has also been used to kill lice, though some caution is advised since it can cause skin irritations[238]. A red or purple dye is obtained from the flowering tops[4, 7, 13, 100], it is neither brilliant nor durable[115]. The plant repels ants[46]. The growing plant repels many insect pests so it is a good plant to grow in the vegetable area[201]. A useful ground cover for sunny positions, forming a slowly spreading clump[197, K]. Plants should be spaced about 30cm apart each way[208].

dwatta Antirheumatic Antiseptic Antispasmodic Aromatherapy Carminative Cholagogue Diaphoretic Emmenagogue Expectorant Odontalgic Parasiticide Stimulant Stomachic TonicOriganum has been used as a culinary and medic-

inal herb for thousands of years. It has a beneficial effect upon the digestive and respiratory systems and is also used to promote menstruation[254]. It should not be used medicinally by pregnant women though it is perfectly safe in small amounts for culinary purposes[254]. The leaves and flowering stems are strongly antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, emmenagogue, expectorant, stimulant, stomachic and mildly tonic[4, 7, 9, 21, 254]. The plant is taken internally in the treatment of colds, influenza, mild feverish illnesses, indigestion, stomach upsets and painful menstruation[238]. It is strongly sedative and should not be taken in large doses, though mild teas have a soothing effect and aid restful sleep[244]. It should not be prescribed for pregnant women[238]. Externally, oregano is used to treat bronchitis, asthma, arthritis and muscular pain[238]. The plant can be used fresh or dried - harvest the whole plant (but not the roots) in late summer to dry and store for winter use[244]. Oregano is often used in the form of an essential oil that is distilled from the flowering plant[4]. A few drops of the essential oil, put on cotton wool and placed in the hollow of an aching tooth, frequently relieves the pain of toothache[4, 207]. This plant is one of the best natural antiseptics because of its high thymol content[7]. The essential oil is used in aromatherapy to treat the same kinds of complaints that the herb is used for[238].

propta Seed - sow early spring at 10 - 13°C and only just cover the seed. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late spring. Division in March or October. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings of young barren shoots in June. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden, Seashore. Requires a rather dry, warm, well-drained soil in full sun, but is not fussy as to soil type, thriving on chalk[1, 27]. Prefers slightly alkaline conditions[200]. Tolerates poor soils[24]. Dislikes wet soils[37]. Hardy to about -20°C[187]. Oregano has a long history of culinary and medicinal use and is often cultivated in modern gardens as a culinary herb, there are some named varieties[183, 187, 238, 244]. Plants growing near the sea have the most fragrance[7]. A good companion plant, improving the flavour of nearby plants[201]. The flowers are very attractive to bees and butterflies[5, 30]. A good companion for the cucumber family[14], it is beneficial to all nearby plants[20]. The whole plant has a sweet yet slightly peppery aroma[245]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 5.2.78 Streptopus amplexifolius

Wild Cucumber, Claspleaf twistedstalk, Tubercle twisted-stalk

4 tlin 8 cyuc 4 kcaok 1 tcan 2 dwat 1 m hkuc pcmhmm cyuti tcup hwicli hrsajut hpa7tli flatprkikwis hpa7tmwatli xre7t hjonli

drutta Streptopus amplexifolius is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It

drutta *Fritillaria camschatcensis* is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root SeedpodEdible Uses: Bulb - raw, cooked or dried for later use[2, 46, 105, 183]. A staple food in areas where it grows wild[177], when cooked it tastes like baked chestnuts[74]. One report says that the bulbs have a slightly bitter taste, even after cooking[256]. The best-tasting bulbs are said to come from coastal areas where the plants are occasionally covered with salt water[254]. A pudding is made by mixing the bulbs with the fruit of *Empetrum nigrum*[183]. The bulb is also dried and ground into a powder, then used as a flour or starch for making breads and soups[183]. The bulb is best if harvested in the autumn[172], it resembles a cluster of cooked rice grains[207]. The green seedpods can be eaten raw or cooked. They are somewhat bitter[172].

tcanta None known

dwatta None known

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[11]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta A woodland plant, preferring a moraine or rock garden[1]. Easily grown in a light moist but well-drained sandy woodland soil[42, 163, 200]. Prefers a moist peaty soil and partial shade and must not be allowed to become dry[90]. Another report says that it prefers a sunny position[42] whilst yet another says that it succeeds in full sun or light shade in a rich soil[200]. The plants often grow close to the sea and survive periodic inundation with salt water[256]. The dormant bulb is very hardy and has withstood soil temperatures down to -20°C, though the embryonic flower shoot will be damaged at temperatures around -15°C[214]. A very ornamental plant[1], it is very variable in size and flower colour[90]. The flowers are sweetly scented[245]. Plants flower within 3 - 5 years from seed[164]. The plant is heat tolerant in zones 8 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.119 Hemerocallis lilioasphodelus

Yellow Day Lily

4 tlin 8 cyuc 4 kcaok 2 tcan 2 dwat 0.6 m hkuc hmimhtut cyuti kyuctcup hwicli hrsajut hpa7tli flatprkikwis hpa7tmwatli fyixre7t hjonli

drutta *Hemerocallis lilioasphodelus* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA

hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Root ShootsEdible Uses: Leaves and young shoots - raw or cooked like asparagus or celery[85, 105, 183]. They must be consumed when very young or else they become fibrous[K]. Flower buds - raw or cooked. They taste somewhat like green beans[85, 105]. They contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Flowers - raw or cooked[85, K]. They can be dried and used as a thickener in soups etc[183]. If the flowers are picked just as they start to wither they can be used as a condiment[85]. The flowers are a traditional food in China where they are steamed and then dried[266]. Root - cooked[85, 105]. They taste like a blend of sweet corn and salsify[183]. We have found them to be tender but fairly bland with a slight sweetness[K]. The swollen roots are quite small and are only really worthwhile using if the plant is being dug up for divisions or for other reasons[K].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205]. Plants form a spreading clump and are suitable for ground cover when spaced about 45cm apart each way[208]. The dead leaves should be left on the ground in the winter to ensure effective cover[208].

dwatta Antidote Cancer Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. The root also has a folk history of use in the treatment of cancer - extracts from the roots have shown antitumour activity[218]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88, 111]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Plants are very cold-hardy, tolerating temperatures down to about -25°C[187]. A very vigorous plant, spreading by underground rhizomes[1]. The plant has a fibrous root system with occasional spindle-like swellings[205]. Cultivated as a food and medicinal plant in Japan[127]. Individual flowers are short-lived, they open at night and last for 20 - 76 hours. The plant produces a succession of blooms over a period of about 2 months[205]. The flowers are fragrant[205]. The flowers have a honeysuckle-like scent and this can pervade the air for a considerable distance when warmed by the summer sunshine[245]. Hybridizes freely with other members of this genus[200]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. The plant is heat tolerant in zones 12 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth

be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -18°C[202]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. Probably a natural hybrid, *C. pruinosa* x *C. suborbiculata*[43].

## 5.2.116 *Astrebla squarrosa*

Bull Mitchell grass

4 tin 12 cyuc 4 kacak 1 tcan 0 dwat 1.5 m hkuc htut cyutli hgatkycutcup hwicli hyishrasjltunykfrrip hpa7tli flatprikrlwis hpa7tmwatli hjonli

drutta *Astrebla squarrosa* is a PERENNIAL growing to 1.5 m (5ft) by 0.1 m (0ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 10. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Carbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. Cultivated in the past but largely or completely abandoned.

tcanta Providing habitat for organisms such as mammals.

dwatta None Known  
propta Wild. Seed.

nwatta Historic Crop Management: Standard Staple Crop: Balanced carbClimate: subtropical to tropical. Humidity: semi-arid. Grow on clay soils, mainly between an upper limit of 600 mm average annual rainfall, and a lower limit of 200 mm, and even below in depressions where the water concentrates following rains e.g. in Sturt's Stony Desert. Mitchell grasses are deep rooted and become dormant during drought, allowing them to survive extended periods without rainfall. Carbon Farming Solutions - Cultivation: historic crop. Cultivated in the past but largely or completely abandoned. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.117 *Prunus cerasifera divaricata*

4 tin 8 cyuc 4 kacak 0 tcan 1 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrrip hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta *Prunus cerasifera divaricata* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[74]. Tastes like a Mirabelle plum[2, 11]. A very pleasant plum-like flavour when fully ripe with a mealy though juicy flesh[K]. It is high in citric acid, containing about 4.7%[74]. The fruit is about 30mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye RootstockUsed as a rootstock for plums, peaches and apricots[74]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts, this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Requires a well-drained moisture retentive soil[11, 200]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Grows well in heavy clay soils. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. Plants are hardy to about -25°C[184]. According to some botanists this plant should be named *P. divaricata* and *P. cerasifera* should be named *P. divaricata cerasifera*[11]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.118 *Fritillaria camschatcensis*

Kamchatka Lily, Kamchatka fritillary

4 tin 8 cyuc 4 kacak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrrip hpa7tli flatprikrlwishsom hpa7tmwatli xre7t hjonli

can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit Leaves RootEdible Uses: Fruit - raw or cooked in soups and stews[105, 161, 172]. Juicy with a cucumber flavour[183], they are reported to be slightly cathartic when growing in certain areas only[183]. The fruit is laxative if eaten in large quantities according to another report[172]. The oval berry is up to 15mm long[235]. Tender young shoots - raw in salads or cooked like asparagus[177, 183, 257]. A cucumber-like flavour[172, 183]. Root - raw. It is sometimes used in salads for its cucumber flavour[105, 177, 183].

tcanta IncenseThe plant has been tied to the clothes, body or hair and used as a scent[257].

dwatta Analgesic Appetizer Cathartic Haemostatic Kidney Oxytoxic Stomachic VDTThe fruit is cathartic[172, 207]. An infusion of the stems and fruit has been used to treat 'sickness in general'[257]. The plant is tonic[257]. An infusion of the whole plant has been used to treat stomach complaints and loss of appetite[257]. A compound infusion of the plant has been used in the treatment of spitting up of blood, kidney problems and gonorrhoea[257]. The root has been chewed in order to induce labour in cases of protracted delay[257]. A compound infusion of the root has been used as an analgesic in the treatment of internal pain[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in a cold frame as soon as it is received. The seed, especially if it has been stored, can be very slow to germinate, sometimes taking 18 months or more. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in a shady part of the greenhouse or cold frame. It will normally take 2 or more growing seasons before the roots are large enough to plant out - this is best done when the plant is dormant in the autumn. Division as the plant comes into growth in early spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame for their first year, planting them out in the following spring.

nwatta Requires a cool leafy soil in shade or partial shade[187]. Thrives in a moist light soil containing organic matter[1]. Hardy to at least -20°C. A polymorphic species, there are many sub-species[43]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.79 *Carya hybrids*

Hybrid and neo-hybrid hickories

4 tin 11 cyuc 4 kacak 3 tcan 3 dwat 40 m hkuc htut cyutli kyucutcup hwicli hrasjltunykfrrip hpa7tli flatprikrlwis hpa7tmwatli hjonli

drutta *Carya hybrids* is a deciduous Tree growing to 40 m (131ft) by 35 m (114ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Oil-Carbon Farming Solutions - Staple Crop: oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

tcanta OilSee individual plant entries. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta See individual species.

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant

the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Management: Standard Minor Global Crop Staple Crop: OilClimate: cold temperate to subtropical, tropical highlands. Humidity: humid. Carbon Farming Solutions - Cultivation: minor global crops. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1]. . For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.80 *Mentha x villosa alopecuroides*

Apple Mint, Bowles' Mint

4 tin 8 cyuc 4 kacak 3 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrrip hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta *Mentha x villosa alopecuroides* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked[14]. A strong spearmint flavour, they are used as a flavouring in salads or cooked foods[183], this is also the main species that is used to make mint sauce. A herb tea is made from the fresh or dried leaves[21, 183].

tcanta Essential Repellent StrewingAn essential oil is obtained from the whole plant. The plant repels insects and was formerly used as a strewing herb[14, 18, 20]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Antiseptic Carminative FebrifugeApple mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. A tea made from the leaves of most mint species has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta A very easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. Prefers a slightly acid soil[16]. A sunny position is best for the production of essential oils, but the plant also succeeds in partial shade. Apple mint is commonly grown in the herb garden. There is at least one named variety, 'Bowles mint' is said to be a superior form and it is the form usually cultivated commercially for mint sauce. Unlike most members of the genus, this species is resistant to the disease 'rust'[238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The whole plant has a strong aroma of spearmint. The flowers are very attractive to bees and butterflies[24]. A good companion for growing near cabbages and tomatoes, helping to keep them free of insect pests[14, 20]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.81 Amelanchier basalticola

Dwarf Service-berry
4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 3 m hkuc
hmimhtut cyutli tcup hwicli hrasjltutnyikfriip hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta Amelanchier basalticola is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: We have no records for this species, but the fruit is almost certainly edible both raw or cooked[K]. It is 9 - 12mm in diameter[200]. The fruit is rich in iron and copper[226].

tcanta None known
dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Prefers an acid or neutral soil. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible oramentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. There is much difference of opinion in the naming of members of this genus, with many botanists viewing this species as no more than a form of *A. alnifolia*[60].

It hybridizes freely with other members of the genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 5.2.82 Allium cepa aggregatum

Potato Onion
4 tlin 8 cyuc 4 kcaak 3 tcan 3 dwat 1.2 m hkuc
htut cyutli tcup hwicli hrasjltut hpa7tli flatprikwiisslip hpa7tmwatli xre7t hjonli

drutta Allium cepa aggregatum is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[4, 33]. A nice onion flavour, when chopped up finely they make a nice addition to salads and can also be used as a cooked vegetable or as a flavouring in cooked foods[K]. Some of the cultivars are considered to be gourmet onions[183]. Leaves - raw or cooked. A strong onion flavour[K]. Flowers - raw. Used as a garnish on salads. The flowers are somewhat dry and are less pleasant than many other species[K].

tcanta Cosmetic Dye Hair Polish Repellent RustThe juice of the plant is used as a moth repellent and can also be rubbed onto the skin to repel insects[7]. The plant juice can be used as a rust preventative on metals and as a polish for copper and glass[7]. A yellow-brown dye is obtained from the skins of the bulbs[141, 168]. Onion juice rubbed into the skin is said to promote the growth of hair and to be a remedy for baldness[7]. It is also used as a cosmetic to get rid of freckles[7]. The growing plant is said to repel insects and moles[201]. A spray made by pouring enough boiling water to cover 1kg of chopped unpeeled onions is said to increase the resistance of other plants to diseases and parasites[201].

dwatta Anthelmintic Antiinflammatory Antiseptic Antispasmodic Carminative Diuretic Expectorant Febrifuge Hypoglycaemic Hypotensive Lithotropic Skin Stomachic TonicAlthough rarely used specifically as a medicinal herb, the onion has a wide range of beneficial actions on the body and when eaten (especially raw) on a regular basis will promote the general health of the body. The bulb is anthelmintic, anti-inflammatory, antiseptic, antispasmodic, carminative, diuretic, expectorant, febrifuge, hypoglycaemic, hypotensive, lithotropic, stomachic and tonic[4, 7, 21]. When used regularly in the diet it offsets tendencies towards angina, arteriosclerosis and heart attack[254]. It is also useful in preventing oral infection and tooth decay[254]. Baked onions can be used as a poultice to remove pus from sores[254]. Fresh onion juice is a very useful first aid treatment for bee and wasp stings, bites, grazes or fungal skin complaints[7, 201]. When warmed the juice can be dropped into the ear to treat earache[254]. It also aids the formation of scar tissue on wounds, thus speeding up the healing process, and has been used as a cosmetic to remove freckles[7].

propta Seed - sow spring in a cold frame. Seed is seldom produced by this plant[4]. Division in late summer. Harvest the bulbs as the foliage dies down and store them in a cool place. In areas with mild winters the bulbs are traditionally replanted on the shortest day of the year, but in colder areas it is best to wait until late winter or even early spring[4]. Plant the bulbs only just below the soil surface[4].

nwatta Prefers a sunny sheltered position in a light well-drained fertile soil[1] but tolerates most soils. Tolerates a pH in the range 4.5 to 8.3. The potato onion was at one time fairly widely grown as a vegetable, but it has now fallen into virtual disuse[16]. There are still some named forms available[183]. This is a genuinely perennial form of *A. cepa*, the bulb grows deeper in the soil and divides to produce a number of underground bulbs each year in much the same way as shallots. Large bulbs divide to form 5 - 15 bulbs whilst smaller bulbs grow into one large bulb[160]. According to one report, the bulbs should be planted fairly deeply[1], whilst another report says that they should be planted just

germination rate. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions in the summer. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Historic Grain Crop Management: Standard Staple Crop: Balanced carbPrefers a fertile humus rich soil in a sunny position[9, 16, 200]. The plant produces a better quality harvest in the summer if it is grown in light shade[264, K]. A very easily grown plant, it tolerates considerable neglect and succeeds in most soils and situations[16, 33, K]. Good King Henry was at one time frequently cultivated in the garden as a perennial vegetable, but it has fallen out of favour and is seldom grown at present[4, 46]. About thirty plants can produce a good supply of food for four people[264]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.113 Balsamorhiza hookeri

Balsam Root, Hooker's balsamroot, Hairy balsamroot, Idaho balsamroot, Rabbithead balsamroot, Negle
4 tlin 8 cyuc 4 kcaak 0 tcan 1 dwat 0.3 m hkuc
htut cyutli kyuctup hwicli hrasjltut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Balsamorhiza hookeri is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

ckakta Edible Parts: Root SeedEdible Uses: Root - raw or cooked[2, 46, 106, 183, 257]. A sweet and agreeable taste when cooked[61, 105]. Seed - raw or cooked[105, 161]. It can be ground into a powder and formed into cakes for eating raw or made into a bread[257].

tcanta None known

dwatta Stomachic Women's complaintsA decoction of the root has been used for stomach problems, bladder complaints and female complaints[257. The sub-species *B. hookeri hirsuta* has been specified for these uses[257].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination usually takes place within 2 - 6 days at 18°C. Either sow the seed in individual pots or pot up the seedlings as soon as they are large enough to handle and plant them out into their permanent positions in the summer[134]. Division in spring. Very difficult since the plant strongly resents root disturbance[134]. It is probably best to take quite small divisions, or basal cuttings, without disturbing the main clump. Pot these up into individual pots and keep them in light shade in the greenhouse until they are growing away well. Plant them out in the summer if they have grown sufficiently, otherwise over-winter them in the greenhouse and plant out in late spring.

nwatta Requires a deep fertile well-drained loam in full sun[134, 200]. Plants strongly resent winter wet[134, 200]. Hardy to at least -25°C[200]. Plants are intolerant of root disturbance and should be planted into their permanent positions whilst still small[134].

### 5.2.114 Hemerocallis minor

Grassleaf Day Lily, Small daylily
4 tlin 8 cyuc 4 kcaak 2 tcan 1 dwat m hkuc
hmimhtut cyutli kyuctup hwicli hrasjltutnyikfriip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis minor is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has

both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

ckakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked[2, 20, 46, 61, 183]. They must be consumed when very young or else they become fibrous[K]. One report says that eating these leaves appears to stimulate or intoxicate to some extent[2]. Flowers and flower buds - raw or cooked[2, 20, 46, 61]. Considered to be a great delicacy[177]. The flowers are a traditional food in China where they are steamed and then dried[266]. The flowers can be dried and used as a relish or a thickener in soups etc[178, 183]. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked[183, 205]. A radish-like flavour but not so sharp[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Anodyne Antidote Cancer Diuretic Febrifuge Vitamin AAnodyne, antidote, diuretic, febrifuge[178]. The juice of the roots is an effective antidote in cases of arsenic poisoning[205]. The root also has a folk history of use in the treatment of cancer - extracts from the roots have shown antitumour activity[218]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil and a sunny position[111] but tolerating partial shade[88]. Plants flower less freely in a shady position though the flowers can last longer in such a position[205]. Grows well in heavy clay soils. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. A very cold-hardy plant, tolerating temperatures down to about -25°C[187]. Hybridizes freely with other members of this genus[200]. A very ornamental plant, its roots are slender and not tuberous, whilst the rhizomes are not spreading[187]. The roots sometimes have bulbous swellings at their tips[205]. The flowers open in the evening and live for about 2 days[205]. The flowers have a powerful scent of honeysuckle[245]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

### 5.2.115 Crataegus durobrivensis

Caughuawaga Hawthorn
4 tlin 8 cyuc 4 kcaak 2 tcan 2 dwat 5 m hkuc
hmimhtut cyutli hgattcuphja7n hwicli hrasjltutnyikfriip hpa7tli flatprikwiisslip hpa7tmwatli xre7t hjonli

drutta Crataegus durobrivensis is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Midgees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A reasonable size, it is up to 15mm in diameter[200], and is very acceptable for raw eating[K]. It is sweet and fairly juicy when fully ripe with a hint of apple in its flavour[K]. The fruit can be used in making pies, preserves, etc, and can also



obtained from the seed[57]. Although the report does not mention edibility it can be assumed that it is edible. A gum is obtained from the stem. It can be used for chewing[64].

tcanta Adhesive Cleanser Dye Gum Oil OilA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. A semi-drying oil is obtained from the seed[57]. It is used as a substitute for almond oil in skin creams[238]. The bruised leaves, when rubbed within any container, will remove strong odours such as garlic or cloves so long as any grease has first been fully cleaned off[4]. A gum obtained from the stem is used as an adhesive[64]. Espalier.

dwatta Alternative Antiasthmatic Antitussive Astringent Demulcent Diuretic Emollient Expectorant Febrifuge Haemolytic Laxative SedativeAntihistosis[194]. The leaves are astringent, demulcent, diuretic, expectorant, febrifuge, laxative, parasiticide and mildly sedative[21, 218]. They are used internally in the treatment of gastritis, whooping cough, coughs and bronchitis[238]. They also help to relieve vomiting and morning sickness during pregnancy, though the dose must be carefully monitored because of their diuretic action[21]. The dried and powdered leaves have sometimes been used to help heal sores and wounds[21]. The leaves are harvested in June and July then dried for later use[4]. The flowers are diuretic, sedative and vermifuge[4, 21, 176, 194, 218]. They are used internally in the treatment of constipation and oedema[238]. A gum from the stems is alternative, astringent, demulcent and sedative[4, 21, 176, 194, 218]. The seed is antiasthmatic, antitussive, emollient, haemolytic, laxative and sedative[4, 21, 176, 194, 218]. It is used internally in the treatment of constipation in the elderly, coughs, asthma and menstrual disorders[238]. The bark is demulcent, diuretic, expectorant and sedative[4]. It is used internally in the treatment of gastritis, whooping cough, coughs and bronchitis[238]. The root bark is used in the treatment of dropsy and jaundice[218]. The bark is harvested from young trees in the spring and is dried for later use[4]. The seed contains 'laetrile', a substance that has also been called vitamin B17[218]. This has been claimed to have a positive effect in the treatment of cancer, but there does not at present seem to be much evidence to support this[K]. The pure substance is almost harmless, but on hydrolysis it yields hydrocyanic acid, a very rapidly acting poison - it should thus be treated with caution[218]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. The stored seed is best given 2 months warm followed by 3 months cold stratification[113]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. A very low percentage[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Requires a well-drained moisture retentive soil[1, 11]. Thrives in a loamy soil, doing well on limestone[11]. Best not grown in acid soils. Prefers some chalk in the soil but it is apt to become chlorotic if too much is present[1]. Prefers a pH in the range 6 to 7[200]. Succeeds in light shade but fruits better in a sunny position[11]. Requires shelter from north and north-east winds[11] and also from spring frosts[200]. Widely cultivated for its edible fruit in warm temperate areas and continental climates, this is a form of the peach with a smooth skin. There are some named varieties[183]. There are numerous divisions of the varieties according to skin colour etc. Perhaps the most useful from the eaters point of view is whether it is free-stone (the flesh parts easily from the seed) or cling-stone (the flesh adheres to the seed)[200, K]. Trees are normally hardy in southern Britain[11], tolerating temperatures down to about -20°C[184], but they require some protection if cropping is to be at all reliable[11]. This is not due so much to lack of cold hardness, more to the cooler summers in Britain which do not fully ripen the wood and the fruit, plus the unpredictable winters and springs which, in a mild spell, can excite the tree into premature flowering and growth which is

then very liable to damage in any following cold spell. Hand pollination at this time can improve fruit-set[200]. In general it is best to site nectarines in a very warm sheltered sunny position, preferably against a south or west facing wall[200, 219], though some success is occasionally seen with plants grown fully in the open[K]. Most cultivars are self-fertile[200]. Trees are often grafted onto plum or other rootstocks but are said to be better when grown on their own roots in southern Britain[11]. Trees are not generally long-lived[200], this is partly because of the need for the tree to produce a constant supply of new wood since most fruit is formed on one-year old wood (though some fruit spurs are formed)[200]. Garlic is a good companion for this plant, helping to prevent disease, especially peach leaf curl[20, 201]. Tansy grown below peach trees helps to keep them healthier[201]. Peach leaf curl can also be prevented by protecting the plants from winter and early spring rains, perhaps by covering them in plastic[200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. Espalier: tree or other plant that is trained to grow flat against a support (such as a trellis or wall).

### 5.2.112 Chenopodium bonus

Good King Henry

4 tin 8 cyuc 4 kcaak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Chenopodium bonus-henricus is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves SeedEdible Uses: Young leaves - raw or cooked[2, 5, 7, 9, 12, 33]. The leaves wilt quickly after picking and so they need to be used as soon after harvesting as possible[264]. They can be used as a potherb[4]. The leaves are best in spring and early summer, the older leaves become tough and bitter[200]. The raw leaves should only be eaten in small quantities, see the notes above on toxicity. Young leaves can be chopped and used as a small part of mixed salads, though we are not enamoured by their flavour[K]. The cooked leaves make an acceptable spinach substitute, but are best mixed with nicer leaves[K]. The leaves are a good source of iron[244]. Young flowering shoots - cooked[2, 27, 132, 264]. When grown on good soil, the shoots can be as thick as a pencil[4]. When about 12cm long, they are cut just under the ground, peeled and used like asparagus[183]. A very pleasant spring vegetable[K]. The plant is sometimes blanchered by excluding the light in order to produce a longer and more succulent shoot, though this practice also reduces the quantity of vitamins in the shoots[264, K]. Young flower buds - cooked[33, 183]. Considered to be a gourmet food[183], though they are rather small and harvesting any quantity takes quite a while[K]. Seed - ground and mixed with flour then used in making bread etc. The seed is small and fiddly but is easily harvested[K]. It should be soaked in water overnight and thoroughly rinsed before it is used in order to remove any saponins[K].

tcanta DyeGold/green dyes can be obtained from the whole plant[168].

dwatta Emollient Laxative VermifugeThe herb is emollient, laxative and vermifuge[7, 154]. This remedy should not be used by people suffering from kidney complaints or rheumatism[7]. A poultice of the leaves has been used to cleanse and heal chronic sores, boils and abscesses[4, 7]. The seed is a gentle laxative that is suitable for children[7].

propta Seed - sow spring in a cold frame. Germination can be slow, but usually a high percentage will germinate[K]. These seeds germinate best at 20C. Cold stratification of up to 9 weeks at 4C prior to exposure at 20C will increase the

below soil level[4]. Onions grow well with most plants, especially roses, carrots, beet and chamomile, but they inhibit the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 12 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 5.2.83 Bunium bulbocastanum

Pig Nut, Earth-nut

4 tin 8 cyuc 4 kcaak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws  
hpa7tmwatli fyifxre7t hjonli

drutta Bunium bulbocastanum is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: CondimentRoot - raw or cooked[46, 61, 115]. A delicious taste very much like sweet chestnuts when cooked[2, K], but the tubers are very small and fiddly to harvest[183]. Seed and flowers. Used as a flavouring[61, 183], they are a cumin substitute[46]. Leaves - raw or cooked. They are used as a garnish and a flavouring in much the same way as parsley[46, 61, 183].

tcanta None known

dwatta AstringentAstringent[61].

propta Seed - sow spring in a cold frame. The seedlings only have one cotyledon[17]. Germination is usually free and quick, prick out the seedlings into individual pots as soon as they are large enough to handle and grow on for their first season in pots. Plant them out into their final positions when dormant in the autumn. The seed can also be sown in situ, but this is best done only if you have lots of seed since far fewer plants will result. Division in spring or autumn.

nwatta See the plants native habitat for ideas on its cultivation needs. The pig nut has at times been cultivated for its edible root[61]. Although quite small in the wild, there is a potential to improve the size of this root through selective breeding and cultivation. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

### 5.2.84 Triteleia grandiflora

Wild Hyacinth, Largeflowered triteleia, Howell's triteleia

4 tin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.7 m hkuc  
htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Triteleia grandiflora is a BULB growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy)

and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[207, 257]. A sweet nut-like flavour[212], they can be used like potatoes. Said by some people to be the tastiest of the North American edible bulbs[207]. At their best when slow roasted for an hour when they become rather sweet[183]. Young seedpods - cooked as a potherb[183, 207]. An excellent green[212].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Alternatively, the seed can be sown in spring in a cold frame. Germination usually takes place within 1 - 3 months at 15°C. Sow the seed thinly so that there is no need to prick them out and grow the seedlings in the pot for their first year. Give an occasional liquid feed to ensure that they do not become mineral deficient. Seedlings are prone to damping off so be careful not to overwater them and keep them well ventilated. When they become dormant, pot up the small bulbs placing about 3 in each pot. Grow them on in the greenhouse for another year or two until the bulbs are about 20mm in diameter and then plant them out into their permanent positions when they are dormant in the autumn. Division of flowering size bulbs in autumn. Dig up the clumps of bulbs, replanting the larger ones direct into their permanent positions. It is best to pot up the smaller ones and grow them on in a greenhouse for a year before planting them out when they are dormant in early autumn.

nwatta Requires a rich well-drained sandy loam[1]. Likes plenty of moisture whilst in growth followed by a warm dry period in late summer and autumn[200]. Succeeds outdoors in a very sheltered warm position. Plants grow in patches in the wild and these can cover considerable areas[212]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is a corm swelling at the stem base [1-2].

### 5.2.85 Beta vulgaris craca

Beetroot

4 tin 8 cyuc 4 kcaak 0 tcan 2 dwat 0.9 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Beta vulgaris craca is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[2, 16, 27, 132]. Well-grown roots are sweet and tender, especially when young, and can be grated and used in salads. Beetroots are traditionally boiled until tender then pickled in vinegar and used in salads. The roots can also be cooked and used as a vegetable, they are sweet and delicious when baked[K]. The root contains up to 8% sugar[143]. The root is tasteless when grown on very wet soils and dry when grown on clay soils[132]. Immature roots can be harvested in the summer and early autumn for immediate use, these are usually much more tender than the older roots[K]. Mature roots can be left in the ground all winter and harvested as required, though they might suffer damage in severe winters[K]. Alternatively, they are harvested in late autumn or early winter and will store for up to 6 months in a cool but not dry frost-free place[K]. Leaves - raw or cooked like spinach[183]. A reasonable spinach substitute, though harvesting leaves from growing plants can reduce yields of the roots[K]. Some people dislike the raw leaves since they can leave an unpleasant taste in the mouth[K]. A nutritional analysis is available[218].

tcanta None known

dwatta Antitumor Carminative Emmenagogue Haemostatic Stomachic Tonic Although little used in modern herbalism, beet has a long history of folk use, especially in the treatment of tumours[269]. The root of white-rooted forms contain betaine which promotes the regeneration of liver cells and the metabolism of fat cells[254]. The root of red-rooted forms contains betanin - an anthocyanin similar to those found in red wine - which is partly responsible for red beet's immune-enhancing effect[254]. The root is carminative, haemostatic, stomachic and a tonic for women[218]. The root can be used as part of the diet, or the juice can be extracted and used as a health-promoting drink[254]. At least one litre of the juice from red-rooted forms must be taken each day in order to stimulate the immune system[254]. The juice is prescribed by herbalists as part of a cancer-treatment regime[254]. A decoction prepared from the seed has been used as a remedy for tumours of the intestines. The seed, boiled in water, is said to cure genital tumours[269]. The juice or other parts of the plant is said to help in the treatment of tumours, leukaemia and other forms of cancer such as cancer of the breast, oesophagus, glands, head, intestines, leg, lip, lung, prostate, rectum, spleen, stomach, and uterus[269]. Some figure that betacyanin and anthocyanin are important in the exchange of substances of cancer cells; others note two main components of the amines, choline and its oxidation product betaine, whose absence produces tumours in mice[269]. The juice has been applied to ulcers[269]. A decoction is used as a purgative by those who suffer from haemorrhoids in South Africa[269]. Leaves and roots used as an emmenagogue[269]. Plant effective in the treatment of feline ascariasis[269]. In the old days, beet juice was recommended as a remedy for anaemia and yellow jaundice, and, put into the nostrils to purge the head, clear ringing ears, and alleviate toothache[269]. Beet juice in vinegar was said to rid the scalp of dandruff as scurf, and was recommended to prevent falling hair[269].

propta Seed - pre-soaking for 12 hours in warm water prior to sowing encourages mare rapid and even germination[264]. For the earliest crop, ready to harvest in late spring, sow the seed in situ in late February or early March, giving it some protection such as a cloche. The first outdoor sowings can be made in March in situ to provide a crop from early summer onwards. For both of these sowings it is important to choose varieties that are resistant to bolting in case there is a cold spell in the spring. Sowings for the main crop can be made in April to early June to provide roots for autumn, winter and early spring use. Late sowings of fast-maturing varieties can be made in June and early July in order to provide fresh young roots in the autumn.

nwatta A very easily grown plant, it succeeds in sun or light shade in moist soils but prefers a rich well-drained light neutral to alkaline soil[33, 37]. Beets grow well in a variety of soils, growing best in a deep, friable well-drained soil abundant with organic matter, but doing poorly on clay. They prefer an open position and a light well-drained soil[52]. The optimum pH is 6.0 - 6.8, but neutral and alkaline soils are tolerated in some areas. Some salinity may be tolerated after the seedling stage. Beets are notable for their tolerance to manganese toxicity[269]. Beet is reported to tolerate an annual precipitation of 23 to 315cm, an average annual temperature range of 5.0 to 26.6°C and a pH of 4.2 to 8.2[269]. Plants are tolerant of saline soils and respond positively if salt is added to non-saline soils at a rate of about 30g per square metre[264]. Beetroot plants are generally hardy in Britain and can be left outdoors in the soil in most winters, though prolonged cold weather or severe winters can damage the roots. If the plants are exposed to prolonged temperatures below -10°C they will quickly run to seed[200]. This also applies to the young plants of most beetroot varieties if they are sown in early spring - a short period where temperatures fall below zero can fool the plant into believing that there has been a winter and it will then try to flower and produce seed. There are, however, come varieties, such as 'Bolthardy', that are more resistant to bolting and so more suited to these early sowings[200, 264]. The beetroot is widely cultivated, especially in temperate zones, for its edible root. There are two basic forms, those with rounded roots and those with elongated roots with many named varieties of each form. The roots can be available all year round from successional sowings. A fast-growing plant, some cultivars can produce a root ready for harvesting within 7 weeks from sowing the seed[264]. Most beetroot seed is actually a cluster of several

seeds, though monogerm varieties have been produced that only have one seed - these monogerm varieties are less likely to require thinning once they have germinated[264]. A good companion for dwarf beans, onions and kohlrabi[18, 201]. Its growth is inhibited by runner beans, charlock and field mustard[18, 201].

## 5.2.86 Quercus robur

Pedunculate Oak, English oak  
4 tin 8 cyuc 4 kcaak 5 tcan 3 dwat 30 m hkuc  
hmmhtut cyutli hgattcuphja7n hwicli jlutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Quercus robur is a deciduous Tree growing to 30 m (98ft) by 30 m (98ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Coffee GumSeed - cooked[2, 5, 8, 13]. Nourishing but indigestible[4]. Chopped and roasted, the seed is used as an almond substitute[8]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost[63]. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[21, 61]. An edible gum is obtained from the bark[177]. Another report says that an edible manna is obtained from the plant and that it is used instead of butter in cooking[183]. This report probably refers to the gum[K].

tcanta Basketry Charcoal Compost Fuel Gum Ink Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20, 201]. The bark is an ingredient of 'Quick Return' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The bark is very rich in calcium[18]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A black dye and an excellent long-lasting ink is made from the oak galls, mixed with salts of iron[4, 7, 66]. The colour is not very durable[4]. When mixed with alum, the dye is brown and with salts of tin it is yellow[4]. Trees can be coppiced to provide material for basket making, fuel, construction etc[23]. The wood is a source of tar, quaiacol, acetic acid, creosote and tannin[123]. Tannin is extracted commercially from the bark and is also found in the leaves[223]. On a 10% moisture basis, the bark contains 11.6% tannin and the wood 9.2%[223]. The bark strips easily from the wood in April and May[4]. A purplish dye is obtained from an infusion of the bark with a small quantity of copperas[4]. It is not bright, but is said to be durable[4]. Wood - hard, tough, durable even under water - highly valued for furniture, construction etc[4, 13, 61, 66]. It is also a good fuel[6] and charcoal[61].

dwatta Antiseptic Astringent Bach Decongestant Dysentery Haemostatic TonicThe oak tree has a long history of medicinal use. It is anti-inflammatory, antiseptic, astringent, decongestant, haemostatic and tonic[4, 7, 9, 13, 21, 165].

## 5.2.109 Amaranthus caudatus

Love Lies Bleeding  
4 tin 8 cyuc 4 kcaak 2 tcan 1 dwat 2 m hkuc  
htut cyutli hgatkuyctup hwicli hyishraslutnyik hpa7tli flat-prikliwisliphsom hpa7tmwatli fyif hjonli

drutta Amaranthus caudatus is an ANNUAL growing to 2 m (6ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid, very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: ColouringLeaves - raw or cooked as a spinach or added to soups etc[22, 46, 61, 105, 183]. The mild flavoured leaves are rich in vitamins and minerals[183, K]. Seed - cooked[22, 46, 57, 105]. Very small but easy to harvest and very nutritious, individual plants can bear up to 100,000 seeds[196]. It is eaten cooked or ground into a powder and used in baking[61, 183, 196]. The seed can also be popped in much the same way as popcorn[97, 183]. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K]. The seed is very nutritious and contains 13 - 18% of a very high quality protein that is rich in the amino acid lysine[196]. It also contains good quantities of calcium, phosphorus, iron, potassium, zinc, vitamin E and the vitamin B complex[196]. A red food colouring called 'betalaina' is obtained from red cultivars[196].

tcanta DyeYellow and green dyes can be obtained from the whole plant[168].

dwatta Anthelmintic AstringentThe plant is astringent, anthelmintic and diuretic[4, 240]. It is used in the treatment of strangury and is applied externally to scrofulous sores[240].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[196, 200]. Grows moderately well in poor soils[200]. Requires a hot sheltered position if it is to do well[K]. Plants are drought resistant though reasonable moisture levels are required for germination and also at pollination[196]. Some forms can tolerate a pH up to 8.5, there are also some that can tolerate mild salinity[196]. It is likely that they will also tolerate acid soils and aluminium toxicity[196]. Plants are not frost-hardy, the most cold tolerant cultivars can tolerate temperatures down to about 4°C[196]. Plants should not be given inorganic fertilizers, see notes above on toxicity. This species is cultivated for its edible seed and leaves in the Andes and various other parts of S. America[46, 61, 97]. It probably arose through cultivation from *A. quitensis*. There are some named varieties[196]. Plants take 4 - 6 months from sowing to harvesting the seed, but up to 10 months in some Andean highland regions[196]. Yields from 1 - 3 tonnes per hectare are common, 5 tonnes has been achieved and research sites have produced the equivalent of 6 tonnes per hectare[196]. The seed is usually harvested just before maturity otherwise some of the seed will be lost during harvesting[196]. Plants usually have downward facing seedheads but varieties have been developed with upward facing heads that can be harvested mechanically[196]. This species is sensitive to day-length most cultivars are short-day and have not done well in northern latitudes, but there are some varieties that flower at day-lengths up to 16 hours[196]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants

that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 5.2.110 Loniceria angustifolia

Narrow-leaved honeysuckle  
4 tin 8 cyuc 4 kcaak 2 tcan 0 dwat 2.7 m hkuc  
htut cyutli tcup hwicli hraslutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Loniceria angustifolia is a deciduous Shrub growing to 2.7 m (8ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[11, 51, 158, 200, 272]. Sweet and pleasant tasting, the fruit is a bit smaller than a blackcurrant[K]. Plants often produce a second crop in late summer[K].

tcanta WoodWood - hard, very close grained. Used for walking sticks[158, 272].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta An easily grown plant, it grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200]. Plants are fairly wind tolerant[K]. Plants flower and fruit better in hotter climates than Britain[182]. Plants have been seen bearing good crops of fruit in eastern Britain, though we have only managed to produce light crops on our Cornish trial grounds[K]. The flowers have a soft 'honeysuckle' perfume[245]. This species is closely related to *L. myrtillus*[11].

## 5.2.111 Prunus persica nucipersica

Neectarine  
4 tin 8 cyuc 4 kcaak 2 tcan 3 dwat 6 m hkuc  
htut cyutli tcup hwicli hraslutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Prunus persica nucipersica is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit Oil SeedEdible Uses: Gum Oil Oil TeaFruit - raw, cooked or dried for later use[1, 2, 34, 46]. The fruit is often used in ice creams, pies, jams etc[183]. When fully ripe, the fruits of the best forms are soft and juicy with a rich delicious flavour[K]. The size of fruit varies between cultivars but can be up to 7cm in diameter and contains one large seed[200]. Flowers - raw or cooked. Added to salads or used as a garnish[183]. They can also be brewed into a tea[183]. The distilled flowers yield a white liquid which can be used to impart a flavour resembling the seed[183]. Seed - raw or cooked. Do not eat if it is too bitter, seed can contain high concentrations of hydrocyanic acid. See the notes above on toxicity. A semi-drying oil is

diameter[200], with a thick flesh[229]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K]. A tea-like beverage can be made from the twigs[257].

tcanta Hedge HedgeThe plant is tolerant of being trimmed and will even resprout if cut back into very old wood. It can be used as a hedge[50]. Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotoxic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta Landscape Uses:Espalier, Pollard, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to at least -18°C[202]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant[11], the branches are almost thornless[229]. A rather variable species, it has been separated into several different species by some botanists[82]. This species is much confused with *C. chrysocarpa*[11] and with *C. coccinea*[50]. It is very closely related to *C. submollis*, differing in having 20 stamens to a flower (as compared to 10 in *C. submollis*)[202]. Special Features: North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture

(form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.108 Actinidia polygama

Silver Vine

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Actinidia polygama is a deciduous Climber growing to 6 m (19ft 8in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked[183]. Not very palatable, it is eaten salted[151, 177]. Some cultivars have nice flavoured fruits[183]. The fruit contains up to 5 times the vitamin C of blackcurrants[74]. Fairly large fruits, up to 3cm across[200]. The ovoid fruits are orange and hairless when fully ripe[266]. It contains a number of small seeds, but these are easily eaten with the fruit[K]. Leaves - raw or cooked[4, 61, 105, 177, 183]. The leaves can also be roasted and mixed with tea[183].

tcanta None known

dwatta Hallucinogenic Sedative Vitamin CThe leaves are hallucinogenic and sedative[192]. The leaves contain substances that make them very attractive to cats and for this reason they are especially useful as a sedative for lions etc in zoos[192]. When consumed in large quantities the leaves can have a mild hallucinatory effect[192]. Polygamol, which is made from the fruits, is used as a heart tonic[218]. A dry decoction is used to treat colic and rheumatism[218].

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. Plants are hardy to about -30°C. when dormant but young growth in spring can be cut back by late frosts[160]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. The flowers are fragrant[245]. This is a climbing plant, supporting itself by twining around branches etc[200]. The plant is very attractive to cats and can be damaged by them[74, 151, 200]. This species has been confused in literature with *A. kolomikta*[198]. It is closely related but can be distinguished by the leaves which are tapered at the base whilst those of *A. kolomikta* are heart-shaped[219]. Plants in this genus are notably resistant to honey fungus[200]. One report suggests that plants are self-fertile whilst another says that they are dioecious. It is likely that most plants are dioecious but that there are some self-fertile hermaphrodite forms. A cultivar named 418-77 is self-fertile[183].

The bark is the part of the plant that is most commonly used[4], though other parts such as the galls, seeds and seed cups are also sometimes used[7]. A decoction of the bark is useful in the treatment of chronic diarrhoea, dysentery, intermittent fevers, haemorrhages etc[4]. Externally, it is used to bathe wounds, skin eruptions, sweaty feet, piles etc[9]. It is also used as a vaginal douche for genital inflammations and discharge, and also as a wash for throat and mouth infections[9]. The bark is harvested from branches 5 - 12 years old, and is dried for later use[9]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'homeopathic', 'Despair, but never ceasing effort'[209]. A 'Despondency' remedy is made from the bark. It is used in the treatment of disorders of the spleen and gall bladder[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Quercus robur* Pedunculate Oak for coughs/bronchitis, diarrhoea, inflammation of mouth and pharynx, inflammation of the skin (see [302] for critics of commission E).

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Young plants tolerate reasonable levels of shade[200]. Succeeds in heavy clay soils[13] and in wet soils so long as the ground is not water-logged for long periods[186]. Dislikes dry or shallow soils but is otherwise drought tolerant once it is established[186]. Tolerant of exposed sites though it dislikes salt-laden winds[186]. The oak is a very important timber tree in Britain, it is also a very important food plant for the caterpillars of many species of butterfly[30], there are 284 insect species associated with this tree[24]. It has often been coppiced or pollarded for its wood in the past[23], though this should not be done too frequently[186], about once every 50 years is the average. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Older trees have a thick corky bark and this can protect them from forest fires, young trees will often regenerate from the base if cut down or killed back by a fire[186]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Immune to attacks by the tortrix moth[1]. This species is notably resistant to honey fungus[88, 200].

## 5.2.87 Sanguisorba minor

Salad Burnet, Small burnet

4 tlin 8 cyuc 4 kcaak 3 tcan 2 dwat m hkuc  
htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Sanguisorba minor is an evergreen Perennial growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year; in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: TeaYoung leaves and shoots - raw or cooked[2, 5, 9, 14, 21]. They are best used before the plant comes into flower[9]. Eaten in salads, used as a garnish or added to soups, cooling drinks and claret cups[183]. Young seedlings are boiled and eaten[183]. A bit fiddly to harvest and the leaves sometimes become bitter in hot dry summers, but they are usually fairly mild tasting in the winter and some people detect a cucumber flavour to them[K]. In the acid soil of our Cornish trial grounds, the

leaves have a distinctly bitter flavour, though when the same plants were grown on a chalky soil they had a much milder flavour[K]. The leaves contain about 5.65% protein, 1.2% fat, 11% carbohydrate, 1.7% ash, 74.5% water[179]. A herb tea is made from the dried leaves[21, 183].

tcanta Soil reclamation Soil stabilizationPlants have extensive root systems and are used for erosion control, they are also used to reclaim landfills and mined-out terrain[160]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Astringent Diaphoretic Eczema Skin StypticBoth the root and the leaves are astringent, diaphoretic and styptic, though the root is most active[4]. The plant is an effective wound herb, quickly staunching any bleeding[244]. An infusion is used in the treatment of gout and rheumatism[244]. The leaves can be used fresh, or are harvested in July and dried (the plant should be prevented from flowering[4]). The root is harvested in the autumn and dried[4]. An infusion of the leaves is used as a soothing treatment for sunburn or skin troubles such as eczema[201].

propta Seed - sow March/April or September/October in a cold frame. Germinates in 3 weeks. Prick out the seedlings when they are large enough to handle into individual pots. Plant them out in the spring or early summer. The seed can also be sown in situ in spring or autumn if you have sufficient seed. Division in spring.

nwatta Prefers a light dry calcareous soil[1, 37, 200] but succeeds in most good soils[1, 37]. Plants also succeed in poor soils[4]. One report says that it grows well in marshy soil[24] but this is possibly a mistake[K]. Dislikes shade[14]. Occasionally cultivated in the herb garden, this is an evergreen herbaceous plant and it supplies fresh edible leaves all the year round, even in quite severe winters[K]. When grown as a salad, the plant should be prevented from flowering[4]. Grows well in the spring meadow[24]. Makes a good edging plant in the border[200]. Plants often self-sow, sometimes to the point of nuisance[K]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.88 Campanula rapunculus

Rampion

4 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli priklwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula rapunculus is a BIENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[2, 5, 33, 37, 100, 183]. A very nice sweet flavour[27], reminiscent of walnuts[2]. They are best mixed with other root vegetables and used in winter salads[2, 9]. Leaves - raw or cooked as a potherb[2, 5, 9, 27, 33, 37, 100, 183]. A fairly bland flavour, with a hint of sweetness, they are quite acceptable raw in salads[K]. The leaves are rich in vitamin C, they make an acceptable winter salad[4]. Young

shoots in spring can be blanched and cooked like asparagus[183].

tcanta None known  
dwatta Vitamin CNone known  
propta Seed - surface sow May/June in situ. The seed usually germinates in 2 - 4 weeks at 18°C[138].

nwatta An easily cultivated plant, it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 4, 200], though it succeeds in most good soils[4]. Tolerates a pH in the range 4.8 to 7.5. Plants are hardy to at least -15°C[200]. Plants often self-sow in the garden[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Rampion was formerly often cultivated for its edible root, though it has fallen into virtual disuse[4]. When grown for its edible root, the plant should not be allowed to flower[4]. Plants can be grown in a meadow[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.89 Acer saccharum nigrum

Black Maple

4 tlin 6 cyuc 4 kcaak 2 tcan 1 dwat 25 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatprikwis hpa7tmwatli hjonli

drutta *Acer saccharum nigrum* is a deciduous Tree growing to 25 m (82ft 0in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Inner Bark Sap SeedEdible Uses: SweetenerThe sap contains reasonable quantities of sugar and can be used as a drink or concentrated into a syrup by boiling off the water[1, 2, 11, 43, 34, 57, 142, 159]. The syrup is used as a sweetener on many foods. The sap can be harvested in late winter or early spring[142], the flow is best on a warm sunny day after a frost. Trees on southern slopes in sandy soils give the best yields. It is best to make a hole about 7cm deep and about 1.3 metres above the ground[171]. Yields of 40 - 100 litres per tree can be obtained[142]. The best sap production comes from cold-winter areas with continental climates. Seed - boiled then roasted[62, 105, 159]. The seed is about 6mm long and is produced in small clusters[82]. Inner bark - cooked. It is dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 161].

tcanta Fuel Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - close grained, tough, hard, heavy. Used for furniture, ship building, etc[43, 46, 61, 82, 171]. It is a good fuel[82]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta AstrigentA decoction of the inner bark has been used in the treatment of diarrhoea[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. A lot of the seed is non-viable, it is best to cut a few open to see if there is an embryo[113]. An average of 95% germination can be achieved from viable seed[98]. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate, sometimes taking two years[125]. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The

rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil but succeeds on most soils[11, 98]. Chlorosis can often develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Grows well in heavy clay soils. Trees need full light and a lot of space[98]. Plants are hardy to about -45°C when fully dormant[160]. This species is not a great success in Britain[1], though it does better than once thought[11]. It grows well in Cornwall[59]. Slow growing when young[11]. Plants produce prodigious root growth but very little top growth in first year from seed[133]. Trees grow rapidly for their first 25 years in the wild, but then slow down and only occasionally surviving for more than 200 years[229]. A very ornamental tree[1] but a bad companion plant, inhibiting the growth of nearby plants[18, 20]. This species is commercially exploited in America for its sap[1, 11]. Along with *A. saccharum* and the sub-species *A. s. grandidentatum* it is the major source of maple syrup[11]. There are some named varieties[183]. The sap can be tapped within 10 - 15 years from seed but it does not flow so well in areas with mild winters[160]. Special Features:North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.2.90 Helianthus tuberosus

Jerusalem Artichoke

4 tlin 8 cyuc 4 kcaak 3 tcan 1 dwat 2.4 m hkuc  
htut cyutli kyuctup hwicli yihshrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Helianthus tuberosus* is a PERENNIAL growing to 2.4 m (7ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in October, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: RootEdible Uses: Coffee SweetenerTubers - raw or cooked[2, 46, 61, 95]. The tuber develops a pleasant sweetness during the winter, especially if subjected to frosts, and is then reasonably acceptable raw[K]. Otherwise it is generally best cooked, and can be used in all the ways that potatoes are used[K]. The tubers are rich in inulin[46], a starch which the body cannot digest, so Jerusalem artichokes provide a bulk of food without many calories[K]. Some people are not very tolerant of inulin, it tends to ferment in their guts and can cause quite severe wind[K]. The tubers are fairly large, up to 10cm long and 6cm in diameter[200]. The tubers burse easily and lose moisture rapidly so are best left in the ground and harvested as required[200]. The inulin from the roots can be converted into fructose, a sweet substance that is safe for diabetics to use[46, 171]. The roasted tubers are a coffee substitute[183].

tcanta BiomassThe plants are a good source of biomass. The tubers are used in industry to make alcohol etc[141]. The alcohol fermented from the tubers is said to be of better quality than that from sugar beets[269]. A fast-growing plant,

ing[238]. The seed residue is poisonous[9, 57]. The roasted seed is used as a coffee substitute[2, 63].

tcanta Charcoal Fuel Hedge Hedge Oil Stuffing Teeth WoodA semi-drying oil is obtained from the seed, it is used as a fuel for lighting, as a lubricant, for polishing wood etc[12, 13, 46, 57, 63]. The seed residue is poisonous[9, 57]. The leaf buds harvested in the winter and dried on the twigs are used as toothpicks[66]. The leaves are gathered in autumn and used as a stuffing material for mattresses etc[115]. Wood - hard, heavy, strong, very durable[13, 46]. It is not suitable for outdoor use[1] and is often attacked by a small beetle[4]. It has a wide range of applications, including furniture, flooring, turnery etc[100]. It makes a very good fuel[6, 66], burning with a lot of heat[4], and yields a charcoal known as 'Carbo Ligni Pulveratus'[46]. The wood has often been used as a source of creosote, tar, methyl alcohol, acetic acid[123]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antacid Antipyretic Antiseptic Antitussive Bach Expectorant Odontalgic SkinThe bark is antacid, antipyretic, antiseptic, antitussive, expectorant, odontalgic[7, 9]. A tar (or creosote), obtained by dry distillation of the branches, is stimulating and antiseptic[4]. It is used internally as a stimulating expectorant and externally as an application to various skin diseases[4, 238]. The pure creosote has been used to give relief from toothache, but it should not be used without expert guidance[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Intolerance', 'Criticism' and 'Passing judgements'[209].

propta Seed - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn[186]. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

nwatta Landscape Uses:Firewood, Pest tolerant, Hedge, Aggressive surface roots possible, Screen, Specimen. Thrives on a light or medium soil, doing well on chalk, but ill-adapted for a heavy wet soil[1, 11]. Prefers a calcareous soil but succeeds in acid soils though it does not make such a fine tree in such a situation[186]. Succeeds in almost any soil and any pH, it is also very tolerant of a wide range of climatic conditions so long as there is sufficient rainfall[200]. Established trees are drought tolerant[186]. Very wind tolerant but dislikes salt[200]. Trees are shallow rooted and this might make them less wind resistant[186]. Trees have two growth periods a year, each of about 3 weeks in duration. The first is in spring around the end of April, the second is in summer, around the end of July. Trees are often slow growing and also can be very slow to establish after transplanting. However, in good conditions they are capable of growing up to a metre in a year. Young trees are very shade tolerant, but are subject to frost damage to their flowers and young leaves and so are best grown in a woodland position which will protect them[200]. An important food plant for many caterpillars, it has 64 species of associated insects[24].

Trees have a heavy canopy and cast a dense shade, very few other species can grow in a dense beech wood and on suitable soils it becomes the dominant species[186]. Very intolerant of coppicing, trees producing none or only very weak growth afterwards and this is soon smothered by other plants[186]. Plants are very tolerant of light pruning however and if this is carried out in late summer the plants will retain their dead leaves over winter[29]. There are many named forms selected for their ornamental value. Those forms with purple leaves prefer a position in full sun whilst forms with yellow leaves prefer some shade[188]. This species is notably resistant to honey fungus[200]. Special Features: Not North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 4. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The

Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.106 Balsamorhiza deltoidea

Deltoid Balsamroot

4 tlin 8 cyuc 4 kcaak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Balsamorhiza deltoidea* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Root Seed ShootsEdible Uses: CoffeeRoot - raw or cooked[22, 46, 61, 105, 106]. A sweet taste when cooked[161]. Young shoots - raw[46, 105, 161]. Seed - raw or cooked. It can be ground into a powder and made into a bread[46, 105, 161]. The ground seeds can be formed into cakes and eaten raw[257]. The roasted root is a coffee substitute[177].

tcanta MiscellanyNone known

dwatta MiscellanyA decoction of the split roots has been used in the treatment of coughs and colds[257].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination usually takes place within 2 - 6 days at 18°C. Either sow the seed in individual pots or put up the seedlings as soon as they are large enough to handle and plant them out into their permanent positions in the summer[134]. Division in spring. Very difficult since the plant strongly resents root disturbance[134]. It is probably best to take quite small divisions, or basal cuttings, without disturbing the main clump. Pot these up into individual pots and keep them in light shade in the greenhouse until they are growing away well. Plant them out in the summer if they have grown sufficiently, otherwise over-winter them in the greenhouse and plant out in late spring.

nwatta Requires a deep fertile well-drained loam in full sun[134, 200]. Plants strongly resent winter wet[134, 200]. Hardy to at least -25°C[200]. Plants are intolerant of root disturbance and should be planted into their permanent positions whilst still small[134].

## 5.2.107 Crataegus mollis

Red Haw, Downy hawthorn

4 tlin 8 cyuc 4 kcaak 2 tcan 2 dwat m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfripr hpa7tli flatprikwisliip hpa7tmwatli xre7t hjonli

drutta *Crataegus mollis* is a deciduous Tree growing to 9 m (29ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[22, 46, 62, 101, 183]. Sub-acid, dry and mealy[82, 227]. The fruit is also used for making jellies and preserves[61, 95, 183]. Fairly large, it is about 20 - 25mm in

grow away[81].

**nwatta** Management: Standard Minor Global Crop Other Systems: Irreg. Intercrop Staple Crop: Protein-oilThrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. This species prefers a cool moist climate[81]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. This species is sometimes cultivated for its edible seed, there are some named varieties[183]. It is one of the main species utilized for its edible seeds[200], being gathered from cultivated and wild trees. Large quantities of the seeds are exported as a food crop from N. China[183]. Plants bear cones when they are 3.5 metres tall in Cornwall[59]. Trees are slow growing when young[11, 81]. Growth in the south-east of Britain is generally poor but trees in the west and north are healthy and growing well with average annual height increases of around 25cm and girth increases of 3cm or more[185]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones do not open, seed is extracted by breaking up the soft scales of the cone[200]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.104 Beta vulgaris cicla

Spinach Beet

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 0.9 m hkuc htuc cyutli tcup hwicli hrasjutnyik hpa7tli flatprikllwissliph-som hpa7tmwatli xre7t hjonli

drutta Beta vulgaris cicla is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil.

**kcaakta** Edible Parts: Leaves StemEdible Uses: Leaves and leaf stems - raw or cooked like spinach[2, 16, 27, 33]. A very good spinach substitute, the leaves are large and easily harvested, yields are high[K]. Some people dislike the raw leaves since they can leave an unpleasant taste in the mouth[K]. Flowering stem - cooked. A broccoli substitute[K].

**tcanta** None known

**dwatta** Although little used in modern herbalism, beet has a long history of folk use, especially in the treatment of tumours[269]. A decoction prepared from the seed has been used as a remedy for tumours of the intestines. The seed, boiled in water, is said to cure genital tumours[269]. The juice or other parts of the plant is said to help in the treatment of tumours, leukaemia and other forms of cancer such as cancer of the breast, oesophagus, glands, head, intestines, leg, lip, lung, prostate, rectum, spleen, stomach, and uterus[269]. Some figure that betacyanin and anthocyanin are important in the exchange of substances of cancer cells; others note two main components of the amines, choline and its oxidation product betaine, whose absence produces tumours in mice[269]. The juice has been applied to ulcers[269]. A decoction is used as a purgative by those who suffer from haemorrhoids in South Africa[269]. Leaves

and roots used as an emmenagogue[269]. Plant effective in the treatment of feline ascariasis[269]. In the old days, beet juice was recommended as a remedy for anaemia and yellow jaundice, and, put into the nostrils to purge the head, clear ringing ears, and alleviate toothache[269]. Beet juice in vinegar was said to rid the scalp of dandruff as scurf, and was recommended to prevent falling hair[269]. Juice of the white beet was said to clear obstructions of the liver and spleen[269]. Culpepper (1653) recommended it for treating headache and vertigo as well as all affections of the brain[269].

**propta** Seed - sow in situ in early April for the summer crop and again in early July to August for the winter and spring crop. It is also possible to obtain an earlier crop by sowing the seed in a tray in a greenhouse in March and planting out in April/May[264].

**nwatta** A very easily grown plant, it succeeds in sun or light shade in moist soils but prefers a rich well-drained light neutral to alkaline soil[33, 37]. Beets grow well in a variety of soils, growing best in a deep, friable well-drained soil abundant with organic matter, but doing poorly on clay. They prefer an open position and a light well-drained soil[52]. The optimum pH is 6.0 - 6.8, but neutral and alkaline soils are tolerated in some areas. Some salinity may be tolerated after the seedling stage. Beets are notable for their tolerance to manganese toxicity[269]. Beet is reported to tolerate an annual precipitation of 23 to 315cm, an average annual temperature range of 5.0 to 26.6°C and a pH of 4.2 to 8.2[269]. Plants are tolerant of saline soils and respond positively if salt is added to non-saline soils at a rate of about 30g per square metre[264]. Spinach beet is often cultivated by gardeners for its edible leaves[16], it does not make a very good commercial crop since the leaves quickly droop after being harvested and so do not stand the journey to market. This plant is a good hot weather substitute for spinach[183]. The leaves are available all year round from successional sowings if the winters are not too severe[K]. In severe winters it is possible to dig up some plants and move them to a protected area such as a greenhouse in order to produce fresh leaves[1]. Plants usually self-sow freely if they are well-sited and the ground is disturbed by hoeing etc[K]. A good companion for dwarf beans, onions and kohlrabi[18], though the growth of spinach beet is inhibited by runner beans, charlock and field mustard[18].

## 5.2.105 Fagus sylvatica

Beech, European beech, Common Beech

4 tlin 7 cyuc 4 kcaak 2 tcan 2 dwat 30 m hkuc pcmhmmhtuc cyutli kyuctcup hwicli hrasjutnyik hpa7tli frusflatprikllwissliph hpa7tmwatli hjonli

drutta Fagus sylvatica is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcaakta** Edible Parts: Leaves Oil SeedEdible Uses: Coffee OilYoung leaves - raw[183]. A very nice mild flavour, they go well in a mixed salad. However, the leaves quickly become tough so only the youngest should be used[2, 5, 12, K]. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Seed - raw or cooked[2, 5, 7, 63, 183]. A pleasant sweet flavour, though rather small and fiddly[K]. The seed can also be dried and ground into a powder and then used with cereal flours when making bread, cakes etc[12]. The seed is rich in oil. The seed should not be eaten in large quantities because it contains a deleterious principle[65, 238]. The seed contains 17 - 20% of an edible semi-drying oil[4, 7, 8, 57]. This stores well without going rancid and is said to be equal in delicacy to olive oil[183]. It is used as a dressing for salads and also for cook-

Jerusalem artichokes can be grown as a temporary summer screen[200]. Very temporary, it is July before they reach a reasonable height and by October they are dying down[K].

**dwatta** Aperient Cholagogue Diuretic Stomachic TonicReported to be aperient, aphrodisiac, cholagogue, diuretic, spermatogenetic, stomachic, and tonic, Jerusalem artichoke is a folk remedy for diabetes and rheumatism[269].

**propta** Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Harvest the tubers in late autumn or the winter and either replant the tubers immediately or store them in a cool but frost-free place and plant them out in early spring. Jerusalem artichoke is propagated by tubers, which should be planted as early as possible in the spring when the soil can be satisfactorily worked[269]. Late planting usually reduces tuber yields and size seriously. Whole tubers or pieces about 50 g (2 oz.) should be planted like potatoes and covered to a depth of 10 cm. Pieces larger than 50 g do not increase the yield, though those smaller will decrease it. Deeper planting may delay emergence, weaken the sprouts, and cause the tubers to develop deeper, making harvest more difficult[269]. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta** Management: Standard Staple Crop: Protein-oilA very easily grown plant, it grows best in a loose circumneutral loam but succeeds in most soils and conditions in a sunny position[1, 16, 37, 38, 269]. Plants are more productive when grown in a rich soil[1, 37, 38]. Heavy soils produce the highest yields, but the tubers are easily damaged at harvest-time so lighter well-drained sandy loams are more suitable[200]. Dislikes shade[1]. Likes some lime in the soil[16]. Jerusalem artichoke is reported to tolerate an annual precipitation of 31 to 282cm, an average annual temperature of 6.3 to 26.6°C and a pH in the range of 4.5 to 8.2[269]. Jerusalem artichokes were cultivated as a food plant by the N. American Indians and they are today often grown in temperate areas for their edible tubers. There are some named varieties[4, 46, 183, 200]. The plant is a suitable crop in any soil and climate where corn (Zea mays) will grow. It survives in poor soil and in areas as cold as Alaska. It also tolerates hot to sub-zero temperatures[269]. The first frost kills the stems and leaves, but the tubers can withstand freezing for months[269]. The plants are particularly suited to dry regions and poor soils where they will out-yield potatoes[200]. Tuber production occurs in response to decreasing day-length in late summer[200]. Yields range from 1 - 2kg per square metre[200]. The tubers are very cold-tolerant and can be safely left in the ground in the winter to be harvested as required. They can be attacked by slugs, however, and in sites prone to slug damage it is probably best to harvest the tubers in late autumn and store them over the winter. It is almost impossible to find all the tubers at harvest time, any left in the soil will grow away vigorously in the spring. Plants do not flower in northern Europe. They are sensitive to day-length hours, requiring longer periods of light from seedling to maturation of plant, and shorter periods for tuber formation. They do not grow where day-lengths vary little[269]. The plant is good weed eradicator, it makes so dense a shade that few other plants can compete[269]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants only produce flowers in Britain after a long hot summer[17] and seed is rarely formed[200]. Grows well with corn[20]. Plants can be invasive[1]. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown

above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.91 Aralia nudicaulis

Wild Sarsaparilla

4 tlin 8 cyuc 4 kcaak 3 tcan 3 dwat 0.4 m hkuc pcmhmm cyutli tcup hwicli hyishrasjutnyik hpa7tli flat-prikllwis hpa7tmwatli xre7t hjonli

drutta Aralia nudicaulis is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcaakta** Edible Parts: Fruit Leaves Root ShootsEdible Uses: Condiment TeaThe rootstock is used as a flavouring[102], it is a substitute for sarsaparilla[43] and is also used for making 'root beer'[183]. It is also used as an emergency food[177] (usually mixed with oil[257]), having a sweet spicy taste and a pleasant aromatic smell[4]. A nutritious food[207], it was used by the Indians during wars or when they were hunting since it is very sustaining[213]. Young shoots - cooked as a potherb[207]. A refreshing herbal tea is made from the root[183]. Pleasantly flavoured[222, 238]. The roots are boiled in water until the water is reddish-brown[256]. A jelly is made from the fruit[207]. The fruit is also used to make wine[257]. The fruit is about 6mm in diameter[200]. The fruit is a round, purplish-black berry.

**tcanta** Groundcover. Wildlife - food source. A specialist nectary plant [1-2].

**dwatta** Alterative Diaphoretic Diuretic Eczema Homeopathy Pectoral StimulantWild sarsaparilla is a sweet pungent tonic herb that acts as an alterative. It had a wide range of traditional uses amongst the North American Indians and was at one time widely used as a substitute for the tropical medicinal herb sarsaparilla[222, 257]. The root is alterative, diaphoretic, diuretic, pectoral and stimulant[4, 21, 213, 222]. The herb encourages sweating, is stimulating and detoxifying and so is used internally in the treatment of pulmonary diseases, asthma, rheumatism, stomach aches etc[4, 213, 238, 254, 257]. Externally it is used as a poultice in treating rheumatism, sores, burns, itchy skin, ulcers and skin problems such as eczema[4, 222, 254]. The root is collected in late summer and the autumn and dried for later use[4, 213]. A drink made from the pulverised roots is used as a cough treatment[213]. A poultice made from the roots and/or the fruit is applied to sores, burns, itchy skin, ulcers, swellings etc[213, 222]. A homeopathic remedy made from the roots is important in the treatment of cystitis[238].

**propta** Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

**nwatta** Prefers a good deep loam and a semi-shady position[1, 134]. Requires a sheltered position[1]. Plants are hardier when grown in poorer soils[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The

root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.92 Sorbus latifolia

French Hales

4 tlin 8 cyuc 4 kcak 0 tcan 0 dwat 14 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Sorbus latifolia is a deciduous Tree growing to 14 m (46ft) by 10 m (32ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (re-produce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. The fruit is usually blotted if it is going to be eaten raw[K]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit. The fruit is up to 1.5cm across[200] and is borne in bunches which makes harvesting easier[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. Probably of hybrid origin with *S. torminalis* as one parent and *S. aria* or a species from that complex as the other parent[11]. The trees usually have apomictic flowers. They thus produce seed asexually, each seedling being a clone of the parent[11].

### 5.2.93 Akebia quinata

Akebia, Chocolate vine, Fiveleaf Akebia, Chocolate Vine

4 tlin 8 cyuc 4 kcak 3 tcan 2 dwat 12 m hkuc pcmhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flat-priklwis hpa7tmwatli dyat hjonli

drutta Akebia quinata is a deciduous Climber growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw[2, 105, 177]. Sweet but insipid[3]. The fruit has a delicate flavour and a soft, juicy texture[K]. Lemon juice is sometimes added to the fruit to enhance the flavour[183]. The bitter skin of the fruit is fried and eaten[183]. The fruit is 5 - 10cm long and up to 4m wide[200, 266]. Soft young shoots are used in salads or pickled[183]. The leaves are used as a tea substitute[105, 177, 183].

tcanta BasketryThe peeled stems are very pliable and can be used in basket making[174]. Plants have sometimes been used as a ground cover, but their method of growth

does not really lend themselves to this use[208]. Scented. Landscape Uses: Arbor.

dwatta Anodyne Antiphlogistic Bitter Cancer Contra-receptive Depurative Diaphoretic Diuretic Emmenagogue Febrifuge Galactogogue Laxative Resolvent Stimulant Stomachic Urinary VulneraryThe stems are anodyne, antifungal, antiphlogistic, bitter, diaphoretic, diuretic, emmenagogue, febrifuge, laxative, galactogogue, resolvent, stimulant, stomachic and vulnerary[174, 178, 218, 238]. Taken internally, it controls bacterial and fungal infections and is used in the treatment of urinary tract infections, lack of menstruation, to improve lactation etc[238]. The stems are harvested in the autumn and dried for later use[238]. The fruit is anti-rheumatic, depurative, diuretic, febrifuge, stomachic and tonic[218]. It is a popular remedy for cancer[218]. The root is febrifuge[218]. The plant was ranked 13th in a survey of 250 potential antifertility plants in China[218].

propta Seed - best sown in a cold frame as soon as it is ripe. Surface sow in a light position[133]. The seed usually germinates in 1 - 3 months at 15°C[133]. Stored seed should be given 1 month cold stratification[113, 133] and can be very difficult to germinate. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[11, 113]. The cuttings can be slow to root[200]. Cuttings can also be taken of soft wood in spring[113]. Root cuttings, December in a warm greenhouse[113]. Layering in early spring[1]. Very easy, the plants usually self-layer and so all you need to do is dig up the new plants and plant them out directly into their permanent positions.

nwatta Requires a well-drained moisture retentive soil[200]. Prefers a good loamy soil[11]. Succeeds in acid or alkaline soils[200]. Prefers partial shade but succeeds in full sun[3, 200]. Succeeds on north facing walls[219]. Plants are fast growing and can be invasive[200]. Dormant plants are hardy to about -20°C but they can be somewhat tender when young[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species grows very well in S.W England[11]. Plants are evergreen in mild winters[11]. Resentful of root disturbance, either grow the plants in containers prior to planting them out or plant them out whilst very young[219]. Plants are not normally pruned, if they are growing too large they can be cut back by trimming them with shears in early spring[202]. The flowers have a spicy fragrance, reminiscent of vanilla[219]. Plants are shy to fruit, they possibly require some protection in the flowering season, hand pollination is advisable[3, 11]. Plants are probably self-sterile[11, 182], if possible at least 2 plants should be grown, each from a different source. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

### 5.2.94 Linum usitatissimum

Flax, Common flax

4 tlin 8 cyuc 4 kcak 4 tcan 3 dwat 0.7 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Linum usitatissimum is a ANNUAL growing to 0.7 m (2ft 4in) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

edible leaves, though it has now fallen out of favour to be replaced by less strong-tasting plants[2, 200, K]. This is a pity because it is a very productive and useful vegetable and can produce its leaves all through the winter if the weather is not too severe[K]. A very important plant for the caterpillars of many species of butterflies[30].

## 5.2.102 Smilax herbacea

Carrion Flower, Smooth carrionflower

4 tlin 8 cyuc 4 kcak 2 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Smilax herbacea is a PERENNIAL CLIMBER growing to 2.5 m (8ft 2in). See above for USDA hardness. It is hardy to UK zone 4. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Leaves RootEdible Uses: GelatineLeaves and young shoots - raw or cooked and used like asparagus[85, 102, 159]. A delicate and palatable vegetable[183]. Fruit - raw or cooked and used in jellies etc[85, 183]. It should only be used when fully ripe[183]. A pleasant flavour[207, 257]. The fruit is about 10mm in diameter[200]. Root - cooked[257]. It can be dried, ground into a powder and then used with cereals for making bread etc[62, 102]. It can also be used as a gelatine substitute[62, 102].

tcanta None known

dwatta Analgesic Antiaphonic Kidney Pectoral Poultice SalveEating the fruit is said to be effective in treating hoarseness[207, 257]. The parched and powdered leaves have been used as a dressing on burns[257]. The wilted leaves have been used as a dressing on boils[257]. The root is analgesic[257]. A decoction has been used in the treatment of back pains, stomach complaints, lung disorders and kidney problems[257].

propta Seed - sow March in a warm greenhouse[1]. This note probably refers to the tropical members of the genus, seeds of plants from cooler areas seem to require a period of cold stratification, some species taking 2 or more years to germinate[K]. We sow the seed of temperate species in a cold frame as soon as we receive it, and would sow the seed as soon as it is ripe if we could obtain it then[K]. When the seedlings eventually germinate, prick them out into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first year, though we normally grow them on in pots for 2 years. Plant them out into their permanent positions in early summer. Division in early spring as new growth begins[238]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them out in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings of half-ripe shoots, July in a frame[238].

nwatta Succeeds in moist soils in sun or semi-shade[200]. Hardy to about -20°C[200]. A polymorphic species, varying in both leaf shape and growth habit[43, 270]. The flowers are malodorous[200], they smell like dead rats[207]. A vigorous plant, it can be grown through trees or shrubs or over tree stumps[200]. The sub-species *S. herbacea nipponicum* is used in Japan[61]. This report probably refers to the species *S. nipponica*[K]. Dioecious. Male and female plants must be grown if seed is required. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herba-ceous.

### 5.2.103 Pinus koraiensis

Korean Nut Pine, Chinese pinenut

4 tlin 7 cyuc 4 kcak 3 tcan 2 dwat 20 m hkuc

htut cyutli hgatkyuctcup hwicli hyhisrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus koraiensis is an evergreen Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 3. It is in leaf all year, in flower in May, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Oil SeedEdible Uses: Condi-ment OilSeed - raw or cooked. Rich in oil[2, 11, 46, 63, 74, 81]. A soft texture with a hint of resin in the flavour, it makes a delicious snack and can also be used as a staple food[K]. The seed can also be dried and ground into a powder then used as a flavouring and thickener in soups etc[183]. Fairly large, the seeds are up to16mm x 12mm[200]. A vanillaflavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide Oil Resin Tannin WoodA tan or green dye is obtained from the needles[168]. The seeds are a source of soap and lubricating oil[266]. Tannin is obtained from the bark[266]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Yields turpentine and tar[74]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc. for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood. Used for construction and carpentry[74, 81]. The timber is used for construction, bridge building, vehicles, furniture, and wood pulp[266].

dwatta Analgesic Antibacterial Antiinflammatory Galac-togogue PoulticeThe seed contains several medically active compounds and is analgesic, antibacterial and antiinflamma-tory[279]. It is used in Korea in the treatment of earache, epistaxis and to promote milk flow in nursing mothers[279]. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valu-able remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respi-ratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. The stem bark is used in the treatment of burns and skin ailments[218].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they estab-lish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to



this is often extracted and used as a sweetener[142]. This plant is a major source of sugar in many temperate areas. The root can also be used as a vegetable. When cooked it is quite tender, but with some fibrous strands. It has a very sweet flavour that some people find too sweet[K]. The raw root is rather tough, but makes a pleasant addition to salads when grated finely[K]. Leaves - raw or cooked. A very acceptable spinach substitute[K]. Some people dislike the raw leaves since they can leave an unpleasant taste in the mouth[K].

tcanta BiomassSugar beet has excellent potential as a biomass crop, both as a source of sugar and also using the plant residue for fuel[269].

dwatta Antitumor EmmenagogueAlthough little used in modern herbalism, beet has a long history of folk use, especially in the treatment of tumours[269]. A decoction prepared from the seed has been used as a remedy for tumours of the intestines. The seed, boiled in water, is said to cure genital tumours[269]. The juice or other parts of the plant is said to help in the treatment of tumours, leukaemia and other forms of cancer such as cancer of the breast, oesophagus, glands, head, intestines, leg, lip, lung, prostate, rectum, spleen, stomach, and uterus[269]. Some figure that betacyanin and anthocyanin are important in the exchange of substances of cancer cells; others note two main components of the amines, choline and its oxidation product betaine, whose absence produces tumours in mice[269]. The juice has been applied to ulcers[269]. A decoction is used as a purgative by those who suffer from haemorrhoids in South Africa[269]. Leaves and roots used as an emmenagogue[269]. Plant effective in the treatment of feline ascariasis[269]. In the old days, beet juice was recommended as a remedy for anaemia and yellow jaundice, and, put into the nostrils to purge the head, clear ringing ears, and alleviate toothache[269]. Beet juice in vinegar was said to rid the scalp of dandruff as scurf, and was recommended to prevent falling hair[269]. Juice of the white beet was said to clear obstructions of the liver and spleen[269]. Culpepper (1653) recommended it for treating headache and vertigo as well as all affections of the brain[269].

propta Seed - sow April in situ.

nwatta Beets grow well in a variety of soils, growing best in a deep, friable well-drained soil abundant with organic matter, but doing poorly on clay. They prefer an open position and a light well-drained soil[52]. The optimum pH is 6.0 - 6.8, but neutral and alkaline soils are tolerated in some areas. Some salinity may be tolerated after the seedling stage. Beets are notable for their tolerance to manganese toxicity. Beet is reported to tolerate an annual precipitation of 23 to 315cm, an average annual temperature range of 5.0 to 26.6°C and a pH of 4.2 to 8.2[269]. Sugar beet is widely cultivated as a commercial sugar crop in temperate climates. About one third of all sugar production in the world is derived from this plant[269]. It is not usually grown on a garden scale. There are several named varieties[46].

## 5.2.100 Hemerocallis exaltata

4 tlin 8 cyuc 4 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli kyuctup hwicli hrasljutnyikfrrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Hemerocallis exaltata is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Leaves and young shoots - cooked[116, 205]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked[105, 177]. They can be dried and used as a thickener in soups etc. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Antidote Diuretic Vitamin CThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A

tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil[200, 205]. Grows well in heavy clay soils. Succeeding in sun or shade, it produces more flowers in a sunny position though these flowers can be shorter-lived in very sunny positions[205]. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. This species is hardy to about -15°C[187]. Hybridizes freely with other members of this genus[200]. Some roots are short and enlarged, others long with spindle-shaped tuberous ends. The plant forms a compact clump[233], but it also produces rhizomes that tend to spread[205]. Individual flowers are very short-lived, they open in the morning and wither in the evening[205]. Plants take a year or two to become established after being moved[200]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

## 5.2.101 Rumex alpinus

Alpine Dock, Munk's rhubarb  
4 tlin 8 cyuc 4 kcaak 1 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Rumex alpinus is a PERENNIAL growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[1, 2, 5, 21, 22, 46, 183]. They can also be dried for later use[12]. A strong flavour, the leaves can be used in salads in late autumn to the spring, but are better cooked like spinach[K]. The fresh leaves can be available for most months of the year, only dying down for a short period in severe winters[K]. The leaves often become bitter in the summer[K]. In taste trials, this has proved to be a very popular autumn and spring cooked leaf, making an excellent spinach[K].

tcanta DyeDark green to brown and dark grey dyes can be obtained from the roots, they do not need a mordant[168].

dwatta Astringent LaxativeThe root is astringent and laxative[4, 9]. It has a regulatory effect on the digestive system, similar to but weaker than rhubarb (Rheum raphaniticum)[4]. It can act either as a laxative or a cure for diarrhoea according to dosage[4]. The root is harvested in early spring and dried for later use[4].

propta Seed - sow spring in a cold frame. The seed can also be sown as soon as it is ripe when it will germinate rapidly and will provide edible leaves from early spring the following year. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Division is easy at almost any time of the year, though the plants establish more rapidly in the spring[K]. Use a sharp spade or knife to divide the rootstock, ensuring that there is at least one growth bud on each section of root. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta A very easily grown and tolerant plant[K], it succeeds in most soils, preferring a moist moderately fertile well-drained soil in a sunny position[200]. Hardy to about -20°C[187]. Alpine dock was at one time cultivated for its

kcaakta Edible Parts: Oil Oil SeedEdible Uses: Coffee Gum Oil OilSeed - raw or cooked[61]. The seed contains 30 - 40% oil, which comprises mainly linoleic and linolenic acids[238]. The seed also contains cyanogenic glycosides (prussic acid). In small quantities these glycosides stimulate respiration and improve digestion, but in excess can cause respiratory failure and death[238]. Cultivars low in these glycosides have been developed and large quantities of the seed would need to be eaten to achieve a harmful dose. The seed is used in breads and cereals, it can also be sprouted and used in salads[183]. The seed is hard to digest and provokes flatulence[4]. A nutritional analysis is available[218]. The roasted seed is said to be a coffee substitute[183]. A herbal tea can be brewed from the seed[183]. An edible oil is obtained from the seed[183, 269], though it needs to be properly refined before it can be eaten. Some caution is advised in the use of the seeds for food since some varieties of this plant contain toxins.

tcanta Biomass Fibre Gum Insulation Oil Oil SizeA fibre is obtained from the stem[6, 7, 13, 57, 89]. It is of very high quality and is used in making cloth, sails, nets, paper, insulating material etc.The best quality flax fibre is used for making cloth. It is soft, lustrous and flexible, although not so flexible or elastic as cotton or wool[269]. It is stronger than cotton, rayon or wool, but weaker than ramie[269]. Lower quality fibre is used in manufacturing of towelling, matting, rugs, twines, canvas, bags, and for quality papers such as printing currency notes[269]. The plant is harvested just after it flowers[115]. The yield is 0.5 to 0.9 tonnes of fibre per hectare. When used for paper making, the stems are harvested in late summer or autumn when they are two thirds yellow and are then retted[189]. The fibre is then stripped from the stem, cooked for two hours or more with lye and then beaten in a Hollander beater[189]. The lower quality flax straw from seed flax varieties is used in the manufacture of upholstery tow, insulating material, rugs, twine, and paper. Some of the better quality straw is used in the manufacture of cigarette and other high-grade papers[269]. The seed contains 38 - 40% of a drying oil[141]. It has a very wide range of applications. The paint and varnish industries consume about 80% of all the linseed oil produced. The remainder is used in items such as furniture polish, enamels, linoleum, oilcloth, printer's inks, soap making and patent leather[46, 57, 169, 244, 269]. It is also used as a wood preservative and as a waterproofing for raincoats, slickers, and tarpaulins[269]. The oil is also used in a spray on concrete roads to prevent ice and snow from sticking - it has the additional benefit of helping to preserve the concrete and prevent surface cracking and wear[269]. Yields of over 4 tonnes of seed per hectare have been recorded in N. America, but yields of 2 tonnes or less are more common[269]. A mulcigen from the soaked or boiled seeds is used as a size for linen warps[169].

dwatta Analgesic Cancer Cardiotoxic Demulcent Emollient Expectorant Laxative Nerve Pectoral Resolvent Urinary VDLinseed has a long history of medicinal use, its main effects being as a laxative and expectorant that soothes irritated tissues, controls coughing and relieves pain[238]. The seed, or the oil from the seed are normally used[238]. The seed is analgesic, demulcent, emollient, laxative, pectoral and resolvent[4, 9, 21, 46, 165, 218, 240]. The crushed seed makes a very useful poultice in the treatment of ulceration, abscesses and deep-seated inflammations[4, 244]. An infusion of the seed contains a good deal of mucilage and is a valuable domestic remedy for coughs, colds and inflammation of the urinary organs[4]. If the seed is bruised and then eaten straight away, it will swell considerably in the digestive tract and stimulate peristalsis[9] and so is used in the treatment of chronic constipation[238]. The oil in the seed contains 4% L-glutamic acid, which is used to treat mental deficiencies in adults[218]. It also has soothing and lubricating properties, and is used in medicines to soothe tonsillitis, sore throats, coughs, colds, constipation, gravel and stones[4, 244]. When mixed with an equal quantity of lime water it is used to treat burns and scalds[244]. The bark and the leaves are used in the treatment of gonorrhoea[240]. The flowers are cardiotoxic and nerve[240]. The plant has a long history of folk use in the treatment of cancer[218]. It has been found to contain various anticancer agents[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Linum usitatissimum for constipation, inflammation of the skin (see [302] for critics of commission E).

propta Seed - sow early to late spring in situ. Do not transplant the seedlings[238].

nwatta Prefers a light well-drained moderately fertile humus-rich soil in a sunny sheltered position[200]. Plants grow best in a well-drained, loamy soil, those overlying a clay subsoil produce the best results[269]. They prefer a pH in the range of 5 - 7[269]. Very light highly fertile soils are not desirable as they produce tall rank growth tending to lodge[269]. Plants are more sensitive to salt than most field crops[269]. Prefers a cool moist climate during the growing season, dry weather making the plants short and woody[61, 269]. A very greedy plant, depleting the soil[4, 123] and requiring a rich, well prepared soil if it is to do well[123]. Plants help to break up organic matter and prepare the soil for following crops[201]. Cultivars selected for seed production succeed under a fairly wide range of conditions, but those selected for fibre production require abundant moisture and cool weather during the growing season, and warm dry weather during harvesting, especially where water-retting is practiced[269]. The crop requires 15 - 20cm of rainfall if spread evenly over growing season, with 2.5 cm falling just before or after planting[269]. The plant needs a relatively long ripening period between flowering and harvesting. Warm, dry weather is desirable at the heading stage to cause plants to branch and produce seed; after vegetative growth, dry weather is required for curing the seed[269]. Linseed has a very long history of cultivation in temperate climates with evidence to show that it was being grown in Egypt over 5,000 years ago[269]. It fell into almost complete disuse in Britain in the 20th century as artificial fibres were increasingly used, but it is once again coming into prominence both as a fibre and as an oilseed crop(1995)[K]. Linseed is grown for its edible seed, the oil from the seed and for the fibres obtained from the stems[46]. There are many named varieties, though these usually fall within two classes. One class, generally known as flax, does not branch much and is grown mainly for the fibre in its stem, whilst the other class, known as linseed, branches much more freely and is grown mainly for its seed. Although classified as a species, linseed is possibly an ancient cultigen derived in cultivation from *L. bienne*[17, 238]. Flax crops take 3 - 4 months to reach maturity, though autumn or early spring sown crops can take 6 - 7 months[269]. *Lolium specis* (Rye grasses) and *Pheum specis* (Timothy grass) have allelopathic effects on *Linum*, reducing its carbohydrate synthesis[269]. Linseed is a good companion plant for potatoes and carrots but is inhibited by *Camelina sativa*[18, 20].

## 5.2.95 Castanea pumila

Chinquapin, Ozark chinkapin  
4 tlin 8 cyuc 4 kcaak 2 tcan 1 dwat 4 m hkuc htut cyutli htkayuctup hwicli hyishrasljutnyik hpa7tli frusflatprki hpa7tmwatli hjonli

drutta Castanea pumila is a deciduous Shrub growing to 4 m (13ft 1in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[2, 61, 105]. Sweet with a nice nutty flavour[46, 82, 183], it is very acceptable raw and has a superior flavour to sweet chestnuts (*C. sativa*)[142, 161, K]. When baked it becomes even sweeter and develops a floury texture, it makes an excellent potato or cereal substitute[K]. The seed is quite small, about 2cm thick[270], which is about half the size of *C. dentata*[183]. It is sold in local markets in America[82]. The seed husks only contain one (rarely two) seed[235]. The seed contains 45% starch and 2.5% protein[213].

tcanta Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - coarse-grained, hard, strong, light, durable, easy to split. It weighs 37lb per cubic foot. Too small for commercial use, but it is occasionally used for fence posts, fuel etc[46, 61, 227, 229].

dwatta Antiperiodic Astringent TonicThe leaves contain tannin and are antiperiodic, astringent and tonic[46, 61, 213]. An infusion of the leaves has been used as an external wash for the feverish condition common to colds[213, 257].

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K]. Division of suckers in winter[200]. They can be planted straight out into their permanent positions.

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. This species is an excellent soil-enriching understorey in pine forests[200], growing and fruiting well so long as the canopy of pines is fairly light. Although it is very winter-hardy, this species only really thrives in areas with hot summers[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants can spread widely by means of underground suckers[11]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Fruits are produced in 2 - 3 years from seed[117]. One report says that plants never fruit in Britain[11], but a 2 metre tall plant at Wisley fruits most years[K]. Trees on our Cornish trial grounds produced a few female flowers when 1 metre tall and 4 years old[K]. This species is occasionally cultivated for its edible seed in N. America, there are some named varieties[183]. The plants produce seeds abundantly in the wild[183]. The sub-species *C. pumila* ashei. Sudw. (Zone 7) is a coastal form, found from Virginia to Texas[200]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.96 Rumex acetosella

Sheeps Sorrel, Common sheep sorrel

4 tlin 8 cyuc 4 kcaak 1 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikhwis hpa7tmwatli nyanhjen hjonli

drutta Rumex acetosella is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for:

light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kckahta Edible Parts: Leaves Root SeedEdible Uses: DrinkLeaves - raw or cooked[4, 12, 55, 62, 183]. A delicious lemon-like flavour, most people consider them too strong to use in quantity, but they are excellent as a flavouring in mixed salads[K]. The leaves should only be used in small quantities due to the oxalic acid content. The leaves can be used as thickeners in soups etc[102], they can also be dried for later use[12]. Root - cooked. It can be dried, ground into a powder and made into noodles[105]. Seed - raw or cooked[172]. Easy to harvest, but the seed is rather small and fiddly to use[K]. A drink similar to lemonade (but without the fizz) is made by boiling up the leaves[102].

tcanta DyeDark green to brown and dark grey dyes can be obtained from the roots, they do not need a mordant[168]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Astringent Diuretic Poultrice UrinarySheep's sorrel is a detoxifying herb, the fresh juice of the leaves having a pronounced diuretic effect[254]. Like other members of the genus, it is mildly laxative and holds out potential as a long term treatment for chronic disease, in particular that of the gastro-intestinal tract[254]. The plant is also part of a North American formula called *essiac* which is a popular treatment for cancer. Its effectiveness has never been reliably proven or disproven since controlled studies have not been carried out. The other herbs included in the formula are *Arctium lappa*, *Ulmus rubra* and *Rheum palmatum*[254]. The whole plant, used in the fresh state, is diaphoretic, diuretic and refrigerant[222]. A tea made from the leaves is used in the treatment of fevers, inflammation and scurvy[222]. The leaf juice is useful in the treatment of urinary and kidney diseases[4]. A leaf poultice is applied to tumours, cysts etc, and is a folk treatment for cancer[222]. A tea made from the roots is astringent and is used in the treatment of diarrhoea and excessive menstrual bleeding[222].

propta Seed - sow autumn or spring in situ. Division in spring.

nwatta Succeeds in most soils[37], preferring a moist moderately fertile well-drained soil in a sunny position[200]. Although a plant of acid soils, it can tolerate some alkalinity[17]. A good food plant for the caterpillars of many species of butterflies[24, 30], it grows well in the summer meadow[24]. Dioecious. Male and female plants must be grown if seed is required. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.97 Crataegus douglasii

Black Hawthorn

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 9 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus douglasii is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kckahta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 95, 99, 101]. A very pleasant flavour with a sweet and juicy succulent flesh[46, 82, K], it makes an excellent dessert fruit and can be eaten in quantity[K]. The fruit can also be used for making pies, preserves etc, and can be

dried for later use[183]. The fruit is about 8mm in diameter and is borne in small clusters[200]. The fruits I have eaten have been considerably larger than this[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Needles WoodThe spines on the branches are used as needles for lancing boils, removing splinters etc[99]. Wood - close-grained, heavy, hard and tough. Used for tool handles etc[82, 99, 101].

dwatta Antirheumatic Astringent Cardiotonic Dysentery Hypotensive Poultrice StomachicAn infusion of the shoots has been used to treat diarrhoea in children and sores in babies mouths[257]. A poultice of the chewed leaves has been applied to swellings[257]. An infusion of the bark has been used in the treatment of diarrhoea and dysentery[257]. An infusion of the sapwood, bark and roots has been used as a stomach medicine[257]. The thorns have been used as a treatment for arthritis[257].The point of the thorn was used to pierce an area affected by arthritic pain. The other end of the thorn was ignited and burned down to the point buried into the skin. This treatment was very painful but it was said that after a scab had formed and disappeared, the arthritic pain had also disappeared[257]. The thorns have been used as probes for boils and ulcers[257]. Although no other specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

#### 5.2.98 Campanula glomerata

Clustered Bellflower, Dane's blood, Clustered Bellflower
4 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 1 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwisslip hpa7tmwatli fyfekre7t hjonli

drutta Campanula glomerata is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. A mild flavour with a pleasant sweetness, it can be used as a major ingredient in salads[K]. Flowers - raw[K]. Beautiful to look at, they have a pleasant sweetness and make a very attractive decoration to a salad[K].

tcanta None known

dwatta None known

propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°c. Very easy[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Very easy[221]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden, Specimen. Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Succeeds in any well-drained soil in sun or partial shade[233]. A very ornamental plant, there are several named forms[200]. This is a very vigorous species and can be invasive, spreading by means of its creeping rootstock, when well suited to its site[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Special Features:Not North American native, Invasive, Attracts butterflies, Suitable for cut flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

### 5.2.99 Beta vulgaris altissima

Sugar Beet

4 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwisslipsh-som hpa7tmwatli xre7t hjonli

drutta Beta vulgaris altissima is a BIENNIAL growing to 1.5 m (5ft) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: Leaves RootEdible Uses: SweetenerRoot - raw or cooked. The root contains 16 - 20% sugar and

hmimhtut cyutli tcup hwicli hrasjut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Liliu canadense is a BULB growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[2, 105, 177]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanum tuberosum). The taste is rather like raw green corn on the ear[207]. The bulb can be dried, ground into a powder and used in making bread etc[257]. A famine food, only used when better foods are not available[257]. The bulb is up to 5cm in diameter[235].

tcanta None known

dwatta Dysentery Poultice StomachicA poultice made from the bulbs is applied to snakebites[222]. A tea made from the bulbs is stomachic and is also used in the treatment of irregular menses and dysentery[222, 257].

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Dislikes lime[42]. The sub-species L. canadense editorium is said to be lime tolerant[163, 200]. Does well in open woodland[1, 143]. Succeeds in partial shade but rapidly degenerates when grown in deep shade[143]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°C[214]. Stolonerous[200], the bulbs should be planted 15 - 25cm deep[143]. Only replant in autumn, never in spring[143]. A very ornamental[1] and easily grown plant[143]. The species is not easy to grow in Europe[90]. Polymorphic, there are a number of sub-species[143]. It hybridizes in nature with L. superbum but it does not hybridize readily in the garden[143]. Closely allied to L. michiganense[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone, 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.272 Liliu canadense editorium

Meadow Lily

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Liliu canadense editorium is a BULB growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[2, 105, 177]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanum tuberosum). The taste is rather like raw green corn on the ear[207]. The bulb can be dried, ground into a powder and used in making bread etc[257]. A famine food, only used when better foods are not available[257]. The bulb is up to 5cm in diameter[235].

tcanta None known

dwatta None known

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Dislikes lime[42]. This sub-species is said to be lime tolerant[163, 200]. Does well in open woodland[1, 143]. Succeeds in partial shade but rapidly degenerates in deep shade[143]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°C[214]. Stolonerous[200], the bulbs should be planted 15 - 25cm deep[143]. Only replant in autumn, never in spring[143]. A very ornamental plant[1], unlike the main species, this form is easily grown in Britain[143]. Polymorphic[143]. It hybridizes in nature with L. superbum but it does not hybridize readily in the garden[143]. Closely allied to L. michiganense[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.273 Tragopogon dubius

Yellow Salsify

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli tcup hwicli hrasjutnyikfrip hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Tragopogon dubius is a ANNUAL/PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can not grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[105, 183]. Fleshy[177]. Young stems, when 5 - 10cm high, and the bases of the lower leaves - raw or cooked. Used as a potherb[183].

tcanta None known

Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Landscape Uses:Firewood, Pollard, Screen, Specimen, Street tree. Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. According to another report this species succeeds in a hot dry position. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. This species thrives in southern England[11], though it prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. The fragrant flowers of this tree are toxic to bees[188]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Rarely produces suckers. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, Attractive foliage, Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 5.2.151 Tilia chinensis

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Tilia chinensis is a deciduous Tree growing to 25 m (82ft 0in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw[K]. A tea is made from the flowers. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta FibreA fibre is obtained from the inner bark and used for making sandals, nets etc[178].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely

if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Closely related to T. intonsa[11]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.152 Quercus palustris

Pin Oak, Swamp Oak

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcup hwicli jutnyik hpa7tli flatprikliws hpa7tmwatli hjonli

drutta Quercus palustris is a deciduous Tree growing to 25 m (82ft) by 8 m (26ft) at a fast rate. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[159]. The seed is about 15mm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Ink Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A black ink is made from the galls[226]. Wood - strong, hard, coarse grained, heavy, often knotty owing to the persistence of many small limbs[46, 61, 82, 171, 227]. It weighs 43lb per cubic foot[227]. It is occasionally used for shingles, clap-boards, furniture, wooden nails etc and as a fuel[46, 61, 82, 171, 227, 229].

dwatta Astringent Dysentery StomachicAn infusion of the inner bark has been used to treat intestinal pains[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Average germination rate is about 68%[227]. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Withstands atmospheric pollution[227]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. A fairly fast growing tree[200]. It is occasionally cultivated for timber in eastern central Europe[50]. It coppices fairly well[227]. The tree seldom lives longer than 150 - 200 years

in the wild, commencing to bear seeds when 15 - 25 years old[229]. Seed production is cyclic, a year of high yields being followed by 2 - 3 years of low yields[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. There are some named varieties selected for their ornamental value[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. This species has a relatively shallow tap-root, making it easier to transplant[226]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms.

### 5.2.153 *Carya cordiformis*

Bitternut, Bitternut Hickory, Swamp Hickory  
4 tin 9 cyuc 3 kcaak 0 tcan 1 dwat 25 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws hpa7tmwatli fyif hjonli

drutta *Carya cordiformis* is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to October, in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil Seed Edible Uses: Oil Seed - raw or cooked[161, 177]. Thin shelled but bitter and astringent[82, 183]. Even squirrels tend to pass it over[226]. The seed is about 3cm long[229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel Oil Rootstock Wood An oil expressed from the seeds has been used as an illuminant in oil lamps[229]. Often used as a potted stock for grafting varieties of pecans (*C. illinoensis*)[227]. Wood - heavy, very hard, strong, elastic, tough, close grained[82, 227, 229]. It weighs 47lb per cubic foot[227]. Although the wood tends to be brittle, it has an amazing quality of shock-resistance and is used for hoops, tool handles etc, though it is considered to be inferior to other hickories[82, 227, 229]. A very good fuel, burning well and giving off a lot of heat[229].

dwatta Antirheumatic Diuretic Laxative The oil from the seeds has been used in the treatment of rheumatism[226]. The bark is diuretic and laxative[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh pot fitted to keep the mice out is ideal)

nwatta Landscape Uses: Pest tolerant, Aggressive surface roots possible. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. This is the hardiest and best growing member of this genus in Britain[11], unfortunately the seed is bitter[82]. Hybridizes in the wild with *C. illinoensis*[43]. Hybridizes with other members of this genus[200]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a

mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Special Features: North American native, Wetlands plant, Inconspicuous flowers or blooms.

### 5.2.154 *Juglans ailanthifolia*

Japanese Walnut

4 tin 8 cyuc 3 kcaak 5 tcan 1 dwat 20 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws hpa7tmwatli fyif hjonli

drutta *Juglans ailanthifolia* is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil Seed Edible Uses: Oil Seed - raw, cooked or used in confectionery[22, 105, 177, 183]. A very good flavour[2]. The shell is easily cracked[117]. An edible oil is obtained from the seed, but it tends to go rancid quickly[183]. Young buds (flower?) and fruit stalks - cooked[105, 177, 183].

tcanta Companion Dye Herbicide Oil Tannin Wood A brown dye is obtained from the seed husks and the bark[61]. Rich in tannin, it does not require a mordant. The bark is rich in tannin. It is used as a dye and also medicinally[178]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. Wood - soft, light, not easily cracked, of good quality. Used for cabinet making etc[46, 61]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anthelmintic Astringent Diuretic Kidney Lithontripic Pectoral Skin Tonic The bark is anthelmintic, astringent, diuretic, lithontripic, pectoral, skin, tonic (kidneys)[178].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. This is the hardiest member of the genus, capable of growing in all areas of Britain[63]. It is also resistant to the attacks of most insects[160]. The young growth in spring, however, can be damaged by late frosts. This species is cultivated for its edible seed in Japan, it has the potential for producing very superior nuts, especially if hybridized with *J. cinerea*[117, 160]. Trees can come into bearing within 3 - 4 years from seed[63]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants

drutta *Symphytum uplandicum* is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft) in at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Edible Uses: Gum Tea Young leaves - cooked or raw[2, 4, 5, 9, 46, 61]. The leaf is hairy and the texture is mucilaginous. It may be full of minerals but it is not pleasant eating for most tastes. It can be chopped up finely and added to salads, in this way the hairiness is not so obvious[183]. Young shoots can be used as an asparagus substitute[46]. The blanched stalks are used[183]. Older leaves can be dried and used as a tea[26]. The peeled roots are cut up and added to soups[183]. A tea is made from the dried leaves and roots[183]. The roasted roots are used with dandelion and chicory roots for making coffee[183].

tcanta Biomass Compost Gum The plant grows very quickly, producing a lot of bulk. It is tolerant of being cut several times a year and can be used to provide 'instant compost' for crops such as potatoes. Simply layer the wilted leaves at the bottom of the potato trench or apply them as a mulch in no-dig gardens. A liquid feed can be obtained by soaking the leaves in a small amount of water for a week, excellent for potassium demanding crops such as tomatoes. The leaves are also a very valuable addition to the compost heap[26, 200]. A gum obtained from the roots was at one time used in the treatment of wool before it was spun[100]. Plants can be grown as a ground cover when planted about 1.2 metres apart each way[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anodyne Astringent Demulcent Eczema Emollient Expectorant Haemostatic Refrigerant Vulnerary Comfrey is a commonly used herbal medicine with a long and proven history in the treatment of various complaints. The root and the leaves are used, the root being more active, and they can be taken internally or used externally as a poultice[4, 222]. Comfrey is especially useful in the external treatment of cuts, bruises, sprains, sores, eczema, varicose veins, broken bones etc, internally it is used in the treatment of a wide range of pulmonary complaints, internal bleeding etc[4, 238, K]. The plant contains a substance called 'allantoin', a cell proliferant that speeds up the healing process[4, 21, 26, 165, 222, 238]. This substance is now synthesized in the pharmaceutical industry and used in healing creams[238]. The root and leaves are anodyne, astringent (mild), demulcent, emollient, expectorant, haemostatic, refrigerant, vulnerary[4, 21, 26, 165, 222]. Some caution is advised, however, especially in the internal use of the herb. External applications and internally taken teas or tinctures of the leaves are considered to be completely safe, but internal applications of tablets or capsules are felt to have too many drawbacks for safe usage[238]. See also the notes above on toxicity. The leaves are harvested in early summer before the plant flowers, the roots are harvested in the autumn. Both are dried for later use[238]. A homeopathic remedy is made from the fresh root, harvested before the plant flowers[232]. This has a very limited range of application, but is of great benefit in the treatment of broken bones and eye injuries[232].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This is a hybrid species that does not usually produce seed. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta Tolerates most soils and situations but prefers a moist soil and some shade[1, 4]. Grows well in heavy clay soils. Best grown in an open sunny site in a deep rich soil

if it is being grown for compost material[200]. Hardy to about -20°C[187]. A naturally occurring hybrid species (*S. asperum* x *S. officinale*), it does not set viable seed and so is not aggressive. The root system is very deep, fragments of root left in the soil can produce new plants. A number of named forms have been selected for their higher production of leaves[183]. Subject to attacks by the rust fungus, this can be alleviated by giving the plants a high potash feed, wood ashes are often used[26]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 5.2.270 *Ribes hirtellum*

Currant-Gooseberry, Hairystem gooseberry

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Ribes hirtellum* is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit Edible Uses: Fruit - raw or cooked in jams, jellies, pies, preserves etc[3, 11, 85, 101, 183]. A smooth-skinned gooseberry[235] with a pleasant taste[183, K]. The fruit can also be dried for later use[183, 257]. The fruit is about 8 - 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Prefers a very sunny position[11]. Hardy to about -20°C[200]. Closely allied to *R. uva-crispa* and *R. oxycanthoides*[11], it is often cultivated for its edible fruit[132] and is the parent of many disease-resistant American gooseberry cultivars[200]. It is sometimes crossed with European hybrids[200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 5.2.271 *Lilium canadense*

Meadow Lily, Canada lily  
4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 1.5 m hkuc

pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Leaves **RootEdible Uses:** Leaves and young stems- raw or cooked[2, 46, 74]. Usually blanched in much the same way as seekale (C. maritima)[61, 183]. **Root - raw or cooked**[105]. The root, which can be as thick as a person's arm, is fleshy and sweet[2, 183]. It can be used raw in salads, or be cooked as a vegetable[2]. It can be dried and ground into a powder, then mixed with cereal flours when making bread[2]. The root is rich in starch and sugars[74].

**tcanta Attracts wildlife.**

**dwatta None known**

**propta Seed - sow** March/April in a seedbed outdoors and either thin the plants out or move them to their permanent positions when about 10cm tall[111]. The young plants are very attractive to slugs so some protection will often be needed. Germination can be slow so it is best to sow the seed in pots in a cold frame[164]. Germination usually takes place in 3 - 26 weeks at 15°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are at least 10cm tall. Division in spring or autumn[1, 111]. Dig up the root clump and cut off as many sections as you require, making sure they all have at least one growing point. The larger of these divisions can be planted out straight into their permanent positions, though small ones are best potted up and grown on in a cold frame until they are established. Root cuttings, 3 - 10 cm long, in spring[104]. These can be planted straight into the open ground or you can pot them up in the greenhouse and plant them out once they are growing strongly.

**nwatta** An easily grown plant, succeeding in a good loam and an open sunny position[1]. Prefers a slightly alkaline soil in a position sheltered from strong winds[200]. Tolerates poor soil and some shade[200]. Dislikes acid soils[1]. A deep-rooted plant[233], it dislikes root disturbance[164]. This is an aggregate species[54]. There is some confusion over the correct spelling of this species name, it is written as C. tataria in some books[50]. Plants can be grown in the summer meadow if the grass is not cut too low (since this would damage the growing point)[200]. A good bee plant[74].

## 5.2.267 Campanula lactiflora

Milky Bellflower

4 tlin 8 cyuc 3 ckak 0 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

**drutta** Campanula lactiflora is a PERENNIAL growing to 1 m (3ft 3in) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Flowers **LeavesEdible Uses:** Leaves - raw or cooked. A mild flavour with a pleasant sweetness[K]. Flowers - raw. A decorative and tasty addition to salads[K].

**tcanta None known**

**dwatta None known**

**propta Seed - best sown** as soon as it is ripe, otherwise surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C. Easy[221]. Plants, especially as they grow, resent root disturbance so, as soon as they are large enough to handle the seedlings should be pricked out into individual pots and grow them on in a cold frame for at least their first winter. It is generally better to grow the plants on in larger pots than average in order to ensure good root development[271]. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Easy[K]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they

are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Another report says that it is difficult to divide the thick tenacious roots of mature plants, and that they resent the disturbance[271].

**nwatta** Succeeds in most fertile well-drained soils[233], though it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. A very tolerant plant, thriving even when growing in unkempt grassy areas[233]. There are some named forms, selected for their ornamental value[200]. Plants tend to be top-heavy and will need supports in windy gardens[233]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Although usually freely set, it is quite difficult to harvest the seed since it is readily dispersed by the plant as soon as it ripens[271]. The plant often self-sows in the garden and, if potted up whilst small, the seedlings usually transplant fairly well[271]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 5.2.268 Berberis cooperi

4 tlin 8 cyuc 3 ckak 1 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasljutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

**drutta** Berberis cooperi is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. An acid taste, but it is pleasant raw in small quantities[K].

**tcanta DyeA** yellow dye is obtained from the root.

**dwatta** Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

**propta Seed - best sown** as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

**nwatta** Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely and resprout well from the base[200].

## 5.2.269 Symphytum uplandicum

Comfrey

4 tlin 8 cyuc 3 ckak 4 tcan 5 dwat 1.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (Malus species), members of the Ericaceae, Potentilla spp and the white pines (certain Pinus spp.)[200]. The leaves of many species also secrete substances that have an inhibitory affect on plants growing underneath them. All in all this is not a very good companion plant[K]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.155 Corylus colurna

Turkish Hazel, Chinese hazelnut, Turkish Filbert, Turkish Hazel

4 tlin 7 cyuc 3 ckak 3 tcan 1 dwat 20 m hkuc  
hmimhtut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatpriklwissip hpa7tmwatli fyif hjonli

**drutta** Corylus colurna is a deciduous Tree growing to 20 m (65ft) by 7 m (23ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**ckakta Edible Parts:** Oil **SeedEdible Uses:** OilSeed - raw or cooked[2, 22, 46, 105]. Rich in oil. As nice a flavour as C. avellana, the common hazel nut[146, 158]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

**tcanta Oil** WoodWood - firm, durable, moderately hard. Used for furniture, turnery etc[74, 158].

**dwatta Tonic**The seeds are tonic[240].

**propta Seed - best sown** as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200].

**nwatta** Management: Standard Regional Crop Staple Crop: Protein-oilLandscape Uses:Firewood, Specimen, Street tree. An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy

soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Tolerates a pH in the range 5.3 to 7.3. Once established, this is a very drought resistant tree[183]. It does not produce suckers[183]. Plants are fairly wind tolerant[1, 11]. A very ornamental tree[1]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. The Turkish hazel is occasionally cultivated for its edible seed[46, 61, 158]. This species is also useful in hybridizing with C. avellana in order to develop superior fruiting cultivars[183]. **Special Features:**Not North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.2.156 Carya x laneyi

4 tlin 8 cyuc 3 ckak 0 tcan 0 dwat 20 m hkuc  
hpa7tmwatli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

**drutta** Carya x laneyi is a deciduous Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**ckakta Edible Parts:** Seed**Edible Uses:** Seed - raw or cooked[183]. Thin shelled[200]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

**tcanta Fuel** WoodWood - close grained, tough, strong, brittle. Used mainly for fuel, it burns well giving off a lot of heat.

**dwatta None known**

**propta Seed - requires** a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

**nwatta** Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. A natural hybrid, C. cordiformis x C. ovata, it is generally faster growing, bears at an earlier age and ripens its seed earlier than C. ovata, but lacks the high quality kernel[183]. There are some named varieties[183]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a

mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

## 5.2.157 Quercus stellata

Post Oak  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 20 m hkuc  
hmimhtut cyutli hgattcut hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Quercus stellata is a deciduous Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kckahta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[61, 63, 105]. A sweet taste[159]. The seed is up to 25mm long and 18mm wide[82, 200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed from some trees might contain bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[177, 257].

tcanta Disinfectant Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - very heavy, hard, close grained, very durable in contact with the soil but difficult to cure. It weighs about 52lb per cubic foot. It is largely used for fencing, lumber, furniture and fuel[46, 61, 82, 149, 159, 171, 227].

dwatta Antihypnotic Astringent Disinfectant Dysentery Emetic Febrifuge TonicThe bark is astringent, disinfectant, emetic, febrifuge and tonic[257]. An infusion is used in the treatment of chronic dysentery, indigestion, asthma, lost voice and intermittent fevers[257]. The bark can be chewed to treat mouth sores[257]. An infusion of the bark can be used as a wash on sore and chapped skin[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable lev-

els of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A slow-growing drought resistant tree, it takes 20 - 30 years before it produces seed[229]. It then usually produces a good crop of seeds every 2 - 4 years[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.158 Gleditsia triacanthos

Honey Locust

4 tlin 8 cyuc 3 kcaak 2 tcan 2 dwat 20 m hkuc  
htut cyutli hgatyuctuc hwicli hyhisrasjnutnyik hpa7tli flatpriklwishsom hpa7tmwatli xre7t hjonli

drutta Gleditsia triacanthos is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in July, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kckahta Edible Parts: Seed SeedpodEdible Uses: Coffee Drink Gum SweetenerSeed - raw or cooked. It can contain up to 30% sugar[160]. Young seeds taste like raw peas[183]. Seeds are not always borne in maritime regions because the tree prefers long hot summers[11]. The oval seeds are about 8mm long[227]. They contain 10.6 - 24.1% protein, 0.8 - 4.3% fat, 84.7% carbohydrate, 21.1% fibre, 4% ash, 280mg calcium and 320mg phosphorus per 100g[218]. The seeds have been roasted and used as a coffee substitute[269]. Seedpods - the pulp is sweet and can be eaten raw or made into sugar[149, 159, 183]. The tender young seedpods can be cooked and eaten[183]. The pulp in older pods turns bitter[227]. The seedpods are up to 40cm long and 4cm wide[227]. A sweet, pleasant tasting drink can be made from the seed pods[257]. The seed pulp has been used to make a drink[257].

tcanta Fodder Gum Soil reclamation Tannin WoodPlanted for land reclamation on mining waste[200]. The gum from the seeds has been suggested as an emulsifying substitute for acacia and tragacanth[269]. The heartwood contains 4 - 4.8% tannin[240]. Wood - strong, coarse-grained, elastic, very hard, very durable in contact with the soil, highly shock resistant[46, 61, 82, 149]. It does not shrink much but splits rather easily and does not glue well[227]. It weighs 42lb per cubic foot[227]. Largely used for making fence posts and rails, wheel hubs, farm implements etc and in construction[46, 61, 82, 149].

dwatta Anaesthetic Antiseptic Cancer StomachicThe pods have been made into a tea for the treatment of indigestion, measles, catarrh etc[222, 257]. The juice of the pods is antiseptic[222]. The pods have been seen as a good antidote for children's complaints[257]. The alcoholic extract of the fruits of the honey locust, after elimination of tannin, considerably retarded the growth, up to 63% of Ehrlich mouse carcinoma[269]. However, the cytotoxicity of the extract was quite high and the animals, besides losing weight, showed dystrophic changes in their liver and spleen[260]. The alcoholic extract of the fruit exerted moderate oncostatic activity against sarcoma 180 and Ehrlich carcinoma at the total dose 350 mg/kg/body weight/mouse. Weight loss was considerable[269]. An infusion of the bark has been drunk and used as a wash in the treatment of dyspepsia[257]. It has also been used in the treatment of whooping cough, measles, smallpox etc[257]. The twigs and the leaves contain the alkaloids gleditschine and stenocarpine[4]. Stenocarpine has been used as a local anaesthetic whilst gleditschine causes stupor and loss of reflex activity[4]. Current research is examining the leaves as a potential source of anticancer compounds[222].

Uses: The plant is used in breeding programmes with the raspberry (*Rubus idaeus*) in North America[317 ]. A purple to dull blue dye is obtained from the fruit[168 ]. The hollowed stems are used as pipes[99 ]. (The report does not specify what type of pipes).

dwatta Analgesic Astringent Disinfectant Odontalgic Poultrice StomachicThe leaves and the root are astringent[172]. A poultice of the chewed leaves has been used as a dressing on burns[257]. The root bark is analgesic, astringent, disinfectant and stomachic[257]. A decoction is used in the treatment of stomach complaints[257]. A decoction has been used to lessen the pains of labour[257]. The powdered bark has been used as a dusting powder on burns and sores[257]. A poultice of the bark has been applied to wounds and aching teeth to ease the pain[257]. A poultice of the chewed bark has been used as a dressing to relieve pain and clean burns and wounds[257].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Grows well in the shade of trees[200] though it is less likely to fruit well in such a position[K]. Hardy to about -25°C[184]. A very ornamental plant, but it is invasive[1]. It does not fruit well in Britain[11], but has become naturalized in Surrey and Cumbria in cool acid woodland soils[182]. This species is a raspberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.264 Cryptotaenia canadensis

Honewort, Canadian honewort  
4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc  
hmim cyutli tcup hwicli hrasjnutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta *Cryptotaenia canadensis* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kckahta Edible Parts: Flowers Leaves Root StemEdible Uses: Young leaves, stems and flowers - raw or cooked[105, 177]. Used as a potherb or added to salads[183]. A flavour that is somewhat like celery[238], if you use your imagination[K]. Root - cooked[177, 183]. The seeds are used as a flavouring for cakes, breads and biscuits[183].

tcanta None known

dwatta None known

propta Seed - sown April in a greenhouse. Germination is usually rapid, prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. The ideal temperature for sowing is about

25°C, though seed does germinate at higher and lower temperatures[206]. Seed can also be sown in early autumn[206]. Division in spring or autumn.

nwatta Succeeds in a rich moist soil, preferring to grow in dappled shade[200, 238]. Closely related to *C. japonica*, a species that is cultivated as a vegetable in Japan[43, K]. This species is being cultivated in America to supply the Japanese market with a chervil-like herb[218]. Slugs are extremely fond of this plant, especially when the new growth emerges in spring[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.265 Angelica sylvestris

Wild Angelica, Woodland angelica  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 1.5 m hkuc  
pcimhmhtut cyutli tcup hwicli hrasjnutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta *Angelica sylvestris* is a BIENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Leaves Root SeedEdible Uses: CondimentLeaves, young shoots and stems - used as an aromatic addition to salads[7], or cooked and used as a vegetable[2, 5, 8, 13, 183]. The taste is somewhat bitter[5]. The chopped leaves are a good addition to cooked acid fruits, especially rhubarb[183]. The stem and leafstalks are used in candies and sweetmeats[2, 46, 105, 183]. Seed - used as an aromatic flavouring in confections and pastries[2, 7]. Root - cooked[2].

tcanta Dye ParasiticideThe pulverized fruits are used to kill head parasites[46, 61]. A good yellow dye is obtained from the plant (the report does not specify which part of the plant)[4].

dwatta Antispasmodic Carminative Diuretic Expectorant Parasiticide Stimulant Stomachic TonicThe root and the seeds are antispasmodic, aromatic, carminative, diaphoretic, diuretic, emmenagogue, expectorant, stimulant, stomachic, and tonic[7, 13, 21, 147, 218]. This plant is less rich in active principles than *A. archangelica* and so is much less used medicinally than that species[9, 244], but a decoction is sometimes used in the treatment of bronchial catarrh, coughs and dyspepsia[9]. Large doses have the effect of depressing the central nervous system[7].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[200]. Succeeds in deep shade. Plants are reliably perennial if they are prevented from setting seed[200].

## 5.2.266 Crambe tatarica

Tartar Bread Plant  
4 tlin 8 cyuc 3 kcaak 2 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hyhisrasjnutnyik hpa7tli prikwlisp hpa7tmwatli xre7t hjonli

drutta *Crambe tatarica* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is



Ground cover, Massing, Rock garden, Seashore, Specimen. A very easily grown plant, it thrives in most soils but prefers a sandy loam and full exposure to the south[11]. Dislikes peaty or chalky soils[111]. Can succeed in light shade[K]. Plants are hardier when grown on poor sandy soils[200]. Established plants are very drought resistant[190]. Plants are hardy to at least -15°C when grown in a well-drained soil. This species is one of the toughest members of the genus and once established is capable of surviving, and even thriving, despite considerable neglect. Plants growing in dense weed competition on our Cornwall trial grounds have managed to spread and even flower[K]. A very ornamental and free flowering species[1], there are some named varieties[182]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in about four years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]. Special Features:Attracts birds, Attractive foliage, North American native, Attracts butterflies, Attractive flowers or blooms.

### 5.2.262 *Monarda fistulosa*

Wild Bergamot, Mintleaf bergamot, Wild Bee-Balm, Lupine  
4 tin 10 cyuc 3 kcaak 2 tcan 2 dwat 1.5 m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli fyifre7t hjonli

drutta *Monarda fistulosa* is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. The entire plant above ground level can be used as a potherb[183], though it is rather aromatic. It is also used as a flavouring in salads and cooked foods[46, 105, 183, 213]. The flowers make an attractive edible garnish in salads[183]. The fresh or dried leaves are brewed into a refreshing aromatic tea[183, 257].

tcanta RepellentThe leaves have been used as an insect repellent[257].

dwatta Carminative Diaphoretic Diuretic Pectoral StimulantWild bergamot was often employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints, but especially those connected with the digestive system[257]. It is still sometimes used in modern herbalism. The leaves and flowering stems are carminative, diaphoretic, diuretic and stimulant[4, 222]. An infusion is used internally in the treatment of colds, catarrh, headaches, gastric disorders, aching kidneys, to reduce low fevers and soothe sore throats[213, 238, 257]. Externally, it is applied as a poultice to skin eruptions, cuts etc and as a wash for sore eyes[238, 257]. The leaves can be harvested before the plant flowers, or they can be harvested with the flowering stems. They can be used fresh or dried[238]. The plant contains the essential oil 'bergamot oil' which can be inhaled to treat bronchial complaints[213]. The leaves also contain 'thymol', an essential oil that can be used to expel gas from the digestive tract[213].

propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°C. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade

in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Massing. Easily grown in ordinary garden soil so long as it is not too dry[1, 200]. Grows well in heavy clay soils. Requires a moist soil and a sunny position[1, 200], though it also succeeds in light shade[187]. This species thrives when grown in a dry soil[233, 238, K]. It prefers alkaline soil conditions[238]. Plants are hardy to at least -25°C[187]. A very ornamental plant, there are several named varieties[1, 233]. A good bee plant[200]. Subject to mildew in dry summers[200]. Special Features:Attracts birds, North American native, Attracts butterflies, Suitable for cut flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.263 *Rubus spectabilis*

Salmonberry

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 1.8 m hkuc  
hmmihtut cyutli tucp hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli ire7t hjonli

drutta *Rubus spectabilis* is a deciduous Shrub growing to 1.8 m (6ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Fruit StemEdible Uses: TeaFruit - raw, cooked or dried for later use[1, 2, 17, 85, 101, 183]. Juicy with a very good flavour[182, 183]. The fruit can be made into jams and jellies[257]. This species is not of much value in Britain, it does not fruit freely in the cooler summers of this country and the fruits do not always develop their full flavour[11]. The fruit can range in colour from yellow, through orange to red, it is about the size of a cultivated raspberry but is rather inferior in flavour and often has a distinctive bitterness, especially in cooler summers[K]. Another report says that it fruits freely in Britain[182]. Young shoots - peeled and eaten raw or cooked like asparagus[11, 101, 118, 183, 257]. They are harvested in the spring as they grow above the soil and whilst they are still tender[161]. Flowers - raw[172]. The leaves are used as a tea substitute[183].

tcanta Disinfectant Dye PipesAgroforestry Uses: The deep root system of salmonberry can help prevent soil erosion on steep slopes[1050] | Salmonberry is a pioneer or early seral species noted for its ability to spread aggressively on disturbed sites. A certain amount of soil disturbance is essential for good seedling establishment. Seedlings generally appear in abundance after fire, timber harvest, or other types of disturbance. Rhizomes enable the plant to spread vigorously and form dense patches. In many areas dense stands may form within 2 to 3 years after disturbance[1050]. The stands will often diminish as tree species become established and form a canopy, though it can persist almost indefinitely, especially under hardwood canopies such as Alder. Other

propta Seed - pre-soak for 24 hours in warm water and then sow in spring in a greenhouse[78]. The seed should have swollen up, in which case it can be sown, if it has not swollen then soak it for another 24 hours in warm water. If this does not work then file away some of the seed coat but be careful not to damage the embryo[78]. Further soaking should then cause the seed to swell. One it has swollen, the seed should germinate within 2 - 4 weeks at 20°C. As soon as they are large enough to handle, prick the seedlings out into individual deep pots and plant them out into their permanent positions in the summer. Give the plants some protection from the cold for their first few winters outdoors.

nwatta Agroforestry Services: Living fence Fodder: Bank Fodder: Pod Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Staple Crop: Balanced carbLandscape Uses:Aggressive surface roots possible, Specimen. Succeeds in most soils, acid or alkaline[160, 200], so long as they are well-drained[202]. Requires a sunny position[111]. Tolerates drought once established[1] and atmospheric pollution[200]. Salt tolerant[200]. The honey locust is speculated to tolerate an annual precipitation of 60 to 150cm, an annual temperature range of 10 to 21°C, and a pH in the range of 6 to 8[269]. Trees are rather tender when young, but they are hardy to about -30°C once they are established[200]. They grow best in southern Britain[11]. The honey locust is often cultivated in warm temperate zones for its edible seeds and seedpods[202], trees start to bear when about 10 years old and produce commercial crops for about 100 years[227]. Wild trees seldom live longer than 120 years[229]. Trees are shy to flower and therefore do not often produce a worthwhile crop in Britain due to our cooler summers[202]. There are some named varieties[183]. The sub-species nana produced lots of viable seed in the hot summer of 1989 at Kew[K], it also had a very good crop in 1994, 1996 and in 1999[K]. The sub-species inermis had a very good crop of pods in the autumn of 1996[K]. 'Ashworth' has pods with a very sweet pulp that has a melonlike flavour[183]. The flowers have a pleasing scent[245]. A very ornamental tree[1], the flowers are very attractive to bees[149, 269]. Trees have a light canopy, they come into leaf late and lose their leaves early[11] making them an excellent canopy tree for a woodland garden. Plants in this genus are notably resistant to honey fungus[200]. Unlike most plants in this family, honey locusts do not fix atmospheric nitrogen[160, 226]. Special Features:North American native, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.159 *Juglans x bisbyi*

Buartnut

4 tin 8 cyuc 3 kcaak 2 tcan 0 dwat 20 m hkuc  
htut cyutli tucp hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Juglans x bisbyi* is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic

(mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw[183]. The shell is thin and the seed well-flavoured[183, 200]. An edible oil is obtained from the seed, it tends to go rancid quickly.

tcanta Herbicide OilPlants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta None known

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113]. This is a hybrid species and so it might not breed true from seed.

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. A hybrid, *J. cinerea* x *J. ailanthifolia cordiformis*, is sometimes cultivated for its edible seed, there are some named varieties[183]. This hybrid combines the best qualities of each parent[200] - the aromatic kernel flavour and superior climatic adaptability of *J. cinerea* with the higher yields, better appearance and crackability of *J. ailanthifolia cordiformis*[183]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 5.2.160 *Juglans cathayensis*

Chinese Walnut

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 20 m hkuc  
htut cyutli tucp hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Juglans cathayensis* is a deciduous Tree growing to 20 m (65ft) by 20 m (65ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[183]. Made into confections and sweet-meats[183]. A good flavour but the shell is very thick and the seed is small[11]. An edible oil is obtained from the seed[183], it tends to go rancid quickly.

tcanta Herbicide OilPlants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)(200).

dwatta None known

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such s the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. A plant growing in an open sunny position at Wisley Garden in Surrey has been seen on a number of occasions bearing good crops of seed[K]. This species is closely related to *J. mandshurica* and is included as a synonym of that species in some modern floras[266]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)(200). The leaves of many species also secrete substances that have an inhibitory affect on plants growing underneath them. All in all this is not a very good companion plant[K].

## 5.2.161 *Quercus x schuettei*

Schuettei's oak

4 tin 8 cyuc 3 kcak 3 tcan 0 dwat 18 m hkuc htut cyutli tcuphja7n hwicli jlutnyik hpa7tli prik hpa7tmwatli hjonli

drutta *Quercus x schuettei* is a deciduous Tree growing to 18 m (59ft) by 18 m (59ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Produces large, edible acorns that are low in tannins. Seed - cooked[101, 105, 161, 257]. The seed can be ground into a powder and used in making bread, dumplings etc and as a thickener in soups[183]. Many trees have sweet seeds with little tannin and the seed can be eaten raw or cooked. If the seed is bitter then this is due to the presence of tannins, these can be leached out by thoroughly washing the dried and ground up seed in water, though many minerals will also be lost. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Agroforestry Uses: rehabilitation of the soil. It may be either seeded or transplanted onto disturbed ar-

eas[1050 ]. Other Uses: The leaves of most species in this genus are more or less rich in tannins. A mulch of the leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc. Fresh leaves should be used with caution, since these can utilize some of the nitrogen in the soil and this inhibit plant growth[20 , K ]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4 ]. The bark has been used as a mordant for fixing dyes[257 ]. The wood is hard, heavy, strong, tough, very durable, close grained. The wood is a good fuel[82 ]. Acorns are abundant and an excellent source of food for wildlife. Schuettei's oak is considered to be a low-maintenance tree with good pest resistance. A medium shade tree for moist landscape areas. Specimen or group. Lawns or parks. Street tree. Well suited to soggy soils. Riverbanks.

dwatta None known

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Schuettei Oak is a hybrid between *Quercus bicolor* (swamp white oak) and *Quercus macrocarpa* (bur oak). It grows best in rich, humusy, medium to wet soils, but can tolerate soggy soils to drier upland soils. Great for low and high areas on properties. Tolerates a wide range of moisture, pH, and soil types. Bloom Time: April to May. Bloom Description: Yellowish-green. Leaf: Good Fall color. Fall color is a yellowish-brown, sometimes tinged with red. Fruit: Showy. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 5.2.162 *Juniperus occidentalis*

Western Juniper

4 tin 8 cyuc 3 kcak 3 tcan 2 dwat 18 m hkuc htut cyutli hgatkuyctup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli dyat hjonli

drutta *Juniperus occidentalis* is an evergreen Tree growing to 18 m (59ft 1in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 61, 105]. A thin dry flesh[82] with a resinous flavour[2, 82]. The fruit is sweet and nutritious[2], it can also be dried or ground into a powder and mixed with cereal flours to be made into a bread[161]. The cones are about 10mm in diameter; they take 2 years to mature[200].

tcanta Basketry Beads Fibre Fuel Intense Lighting Miscellany Tinder WoodThe bark is employed as a tinder and is also made into a slow match[216, 257]. The crushed bark was twisted into a rope, tied at intervals with yucca (*Yucca* species), and wrapped into a coil. The free end was set on fire and kept smouldering by blowing on it at intervals. Fire could be carried in this fashion for several hours[257]. The bark can be wound around a stick and used as a torch to provide light and carry fire to a new campsite[257]. The bark can be rubbed between the hands until it is soft and the fibres can then be woven into clothing[257]. The bark can also be rolled into rope, coiled and then sown to form sandal shoes[257]. The root fibre is used to make twined bas-

that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.260 *Inula helenium*

Elecampane, Elecampane inula

4 tin 8 cyuc 3 kcak 2 tcan 3 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Inula helenium* is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked. Rather bitter and aromatic[115], they were used as a potherb by the ancient Romans[183] but are rarely used at present. Root - candied and eaten as a sweetmeat[4, 7, 27, 105, 183]. It contains up to 44% inulin[46, 240]. Inulin is a starch that cannot be digested by humans. It usually passes straight through the digestive system, though it can ferment and cause wind problems for some people[K]. Inulin can be converted into a sugar that is suitable for diabetics to eat[238]. The Council of Europe list *Inula helenium* as a natural food flavouring.

tcanta Dye EssentialA blue dye is obtained from the bruised and macerated root mixed with ashes and whortleberries (*Vaccinium myrtillus*)[4, 46, 61]. The root yields up to 2% of a camphor-scented essential oil, this is used as a flavouring and medicinally[46, 61, 238].

dwatta Alterative Anthelmintic Antiseptic Antitussive Astringent Bitter Chologogue Demulcent Diaphoretic Diuretic Expectorant Stimulant Stomachic TonicElecampane has a long history of use as a medicinal herb. A gently warming and tonic herb, it is especially effective in treating coughs, consumption, bronchitis and many other complaints of the chest as well as disorders of the digestive system[4, 9, 254]. A very safe herb to use, it is suitable for the old and the young and especially useful when the patient is debilitated[254]. It cleanses toxins from the body, stimulating the immune and digestive systems and treating bacterial and fungal infections[238]. The root is alterative, anthelmintic, antiseptic, astringent, bitter, chologogue, demulcent, diaphoretic, diuretic, mildly expectorant, gently stimulant, stomachic, tonic[4, 7, 9, 21, 46, 165, 200, 218, 222]. It is best harvested in the autumn from plants that are two years old, and it can be dried for later use[4]. The roots should be at least 3 years old according to another report[7]. This remedy should not be prescribed for pregnant women[238]. An extract of the plant is a powerful antiseptic and bactericide, particularly effective against the organism that causes TB[213, 238]. The root contains alantolactone, which is strongly anthelmintic. In a 1:1000 dilution it kills the parasitic worm Ascaris in 16 hours[218]. Alantolactone has an anti-inflammatory action, it also reduces mucous secretions and stimulates the immune system[254]. The plant is sometimes recommended as an external wash for skin inflammations and varicose ulcers, but has been known to cause allergic reactions[238].

propta Seed - sow in spring or autumn in a cold frame[4]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it could be worthwhile trying an outdoor sowing in situ in the spring. Division in spring or autumn[111]. Fairly small pieces of root can be used, so long as each piece has a growth bud on it[4]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings in winter. Cut sections of root about 5cm long, place them in a warm greenhouse over the winter and they should grow away vigorously[4].

nwatta An easily grown plant, it grows well in moist shady positions in ordinary garden soil, though it grows best in a good loamy soil[4]. Succeeds in an ordinary garden soil in a sunny position[1]. Plants are also tolerant of considerable neglect, succeeding on our Cornwall trial ground even when left unweeded for four years[K]. Elecampane has a long history of cultivation as a medicinal herb, though it is not commonly grown nowadays[4]. When first dug up, the roots smell like ripe bananas, but as they dry they take on the scent of violets[245]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 5.2.261 *Yucca filamentosa*

Spoonleaf Yucca, Adam's needle, Desert Candle, Needle Palm, St. Peter's Palm, Spanish Bayonet, Comm

4 tin 10 cyuc 3 kcak 4 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli hgatkuyctup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Yucca filamentosa* is an evergreen Shrub growing to 1.2 m (4ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year; in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Fruit StemEdible Uses: Fruit - raw or cooked[2, 46, 61]. Large and fleshy[161, 183]. The fruit is often dried for winter use[1]. Flowers - raw or dried, crushed and used as a flavouring[159, 164, 177]. A tasty addition to the salad bowl[183]. We have found the flowers to be fairly bitter[K]. Flowering stem - cooked and used like asparagus[164].

tcanta Brush Fibre Paper SoapA fibre obtained from the leaves is used for making ropes, cloth, baskets and mats[21, 46, 61, 82, 169]. The fibre can also be used for making paper[189] The leaves are harvested in summer, they are scraped to remove the outer skin and are then soaked in water for 24 hours prior to cooking. The fibres are cooked for 2 hours with lye and then beaten in a ball mill for 4 hours. They make a cream paper[189]. The leaves are used as paint brushes[92]. The roots are rich in saponins and can be used as a soap substitute for washing the hair, body and clothing[46, 61, 82, 257].

dwatta Poultice SalveMedicinal Parts: Leaves and roots of non-flowering plants[301]. A poultice made from the roots is used in the treatment of sores, skin diseases and sprains[222, 257]. Liver and gallbladder disorders[301].

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°C. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots in a greenhouse until established[78]. Division of suckers in late spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Agroforestry Services: Living fence Industrial Crop; Fiber Management: Standard Regional CropLandscape Uses:Border, Container, Erosion control, Foundation,

the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Dislikes lime[42]. Does well in open woodland but rapidly degenerates in deep shade[143]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°C[14]. A very ornamental plant[1], unlike the main species this form is easily grown in Britain[143]. Polymorphic, there are a number of sub-species. Closely related to *L. michiganense*. Hybridizes in nature with *L. superbum* but does not hybridize readily in the garden[143]. Stoliferous[200], the bulbs should be planted 15 - 25cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Never plant out in the spring[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

### 5.2.258 Heracleum sphondylium

Cow Parsnip, Eltrot

4 tin 8 cyuc 3 kcaak 2 tcan 2 dwat 1.8 m hkuc pcmhimmtt cyuti tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Heracleum sphondylium is a BIENNIAL/PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root StemEdible Uses: SweetenerStem and young shoots - raw or cooked[5, 7, 9, 17]. Used as a green vegetable, when harvested just as they are sprouting from the ground they are somewhat like asparagus in flavour[183]. The rind is somewhat acid[115]. The leaf stems are tied in bundles and dried in the sun until they turn yellow[238]. A sweet substance resembling sugar forms on the dried stems and is considered to be a great delicacy[2, 115, 183, 238]. The peduncles, before flowering, can be eaten as a vegetable or added to soups[183]. Root - cooked. It is usually boiled[7].

tcanta None known

dwatta Antidiarrhoeal Antipsoriatic Aphrodisiac Digestive Expectorant SedativeThe roots and the leaves are aphrodisiac, digestive, mildly expectorant and sedative[7, 9, 238]. The plant is little used in modern herbalism but has been employed in the treatment of laryngitis and bronchitis[9, 238]. A tincture made from the aerial parts of the plant has also been used to relieve general debility, though it is uncertain how it works[7, 238]. The plant is harvested as it comes into flower and can be dried for later use[9].

propta Seed - sow mid to late spring or early autumn in situ. Division in autumn.

nwatta A very easily grown plant, succeeding in any ordinary garden soil[1, 238], doing best in moist soils or deep woodland[1]. Grows well in full sun or partial shade[238]. This species contains a large number of sub-species. Some, but by no means all of them, can cause various problems as detailed at the top of this record. Subspecies transylvanicum, pyrenaicum, montanum, orsinii and alpinum are distinctly phototoxic, subspecies sphondylium and sibiricum are not phototoxic whilst subspecies granatense and ternatum vary in their toxicity[65]. A good bee plant[108]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.259 Oenothera biennis

Evening Primrose, Sun Drop, Common evening primrose
4 tin 8 cyuc 3 kcaak 3 tcan 5 dwat 1.2 m hkuc htut cyuti hgatkycutcup hwicli vyhshrasljut hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Oenothera biennis is a BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves Oil Root. Seedpor Uses: OilRoot - cooked. Boiled and eaten like salsify[4, 12, 27, 33, 66]. Fleshy, sweet and succulent[74]. Wholesome and nutritious[2]. A peppery taste[159]. The taste somewhat resembles salsify or parsnips[183]. Young shoots - raw or cooked[2, 12, 52, 85, 183]. Mucilaginous, with a peppery flavour, they are best used sparingly[159]. Another source suggests that the shoots should not be eaten[9]. Flowers - sweet. Used in salads or as a garnish[183]. Young seedpods - cooked. Steamed[183]. The seed contains 28% of a drying oil[114]. It is edible and a very good source of gamma-linolenic acid[141], an essential fatty acid that is not found in many plant sources and has numerous vital functions in the body. The seed, however, is very small and difficult to harvest, it has to be done by hand[160]. Overall yields are low, making the oil very expensive to produce.

tcanta Cosmetic Dye Miscellany OilThe oil from the seed is added to skin preparations and cosmetics. It is often combined with vitamin E to prevent oxidation[238]. A yellow dye is obtained from the flowers[7]. A finely ground powder made from the flowering stems is used cosmetically in face-masks to counteract reddened skins[7].

dwatta Anticholesterolemic Antipruritic Astringent Eczema Hypotensive Miscellany SedativeThe bark and the leaves are astringent and sedative[4, 21].They have proved of use in the treatment of gastro-intestinal disorders of a functional origin, whooping cough and asthma[4]. A syrup made from the flowers is also an effective treatment for whooping cough[7]. The bark is stripped from the flowering stem and dried for later use, the leaves are also harvested and dried at this time[4]. Evening primrose oil has become a well-known food supplement since the 1980's. Research suggests that the oil is potentially very valuable in the treatment of multiple sclerosis, pre-menstrual tension, hyperactivity etc[66]. It is also taken internally in the treatment of eczema, acne, brittle nails, rheumatoid arthritis and alcohol-related liver damage[238]. Regular consumption of the oil helps to reduce blood cholesterol levels and lower the blood pressure[21, 66]. The seed is a good source of gamma-linolenic acid, an unsaturated fatty acid which assists the production of hormone-like substances[222, 238]. This process is commonly blocked in the body, causing disorders that affect the uterine muscles, nervous system and metabolism[238]. The poulticed root is applied to piles and bruises[222]. A tea made from the roots is used in the treatment of obesity and bowel pains[222].

propta Seed - sow in situ from late spring to early summer[200].

nwatta Prefers a dryish well-drained sandy loam and a warm sunny position[1, 4, 200], though it is tolerant of most soils[4]. Heavy clay soils may induce winter rots[200]. Grows well on very poor soils[160, 238]. Established plants are drought resistant[160]. Formerly cultivated for its edible roots, the evening primrose is being increasingly cultivated for the oil contained in its seed which contains certain essential fatty acids and is a very valuable addition to the diet[66]. See the notes on medicinal uses for more details. The flowers open in the evening and are strongly scented with a delicious sweet perfume[245], attracting pollinating moths[4]. The seeds are a good food source for birds[200]. Plants usually self-sow freely if they are growing in a suitable position, they can naturalize in the wild garden[4, K]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants

kets[257]. The branches have been burnt as an incense and fumigant in the home[257]. The dried seeds have been used as beads or as the 'rattle' in rattles[216]. Wood - very close-grained, light, soft, exceedingly durable. It is easily worked and can be exquisitely finished. Because of its small size, however, it is mainly used for fencing, fuel[46, 61, 82, 229].

dwatta Analgesic Antiseptic Birthing aid Blood tonic Diuretic Febrifuge Laxative Miscellany Odontalgic PouliticeWestern juniper was quite widely employed as a medicinal herb by a number of native North American tribes who used it to treat a variety of complaints, especially those related to the kidneys and the skin[257]. It is rarely, if at all, used in modern herbalism. The leaves are blood tonic and laxative[216]. A decoction is used in the treatment of constipation, coughs and colds[216]. An infusion of the leaves has been taken by pregnant women prior to giving birth in order to relax the muscles[257]. A poultice of the pounded moistened leaves has been applied to the jaw to treat swollen and sore gums and toothaches[257]. The berries are analgesic, blood tonic and diuretic[257]. A decoction is used to relieve the pain of menstrual cramps and to induce urination[257]. Externally, the decoction is used as a poultice on rheumatic joints[257]. The young twigs are antiseptic, blood tonic and febrifuge[257]. A decoction is used in the treatment of kidney problems, fevers, stomach aches, smallpox, influenza and haemorrhages[257]. The branches have been used in a sweat bath to ease rheumatism[257]. A poultice of the twigs has been used as a dressing on burns and as a drawing agent on boils or splinters[257]. A decoction has been used as an antiseptic wash on sores[257]. The leaves or young twigs have been burnt and the smoke inhaled to ease the pain of headaches[257].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils, including chalk, so long as they are well drained[1, 11], preferring a neutral or slightly alkaline soil[11]. Established plants are drought tolerant, succeeding in hot dry positions[200]. Plants are slow-growing, though they can live for 3000 years in the wild[200, 229]. They are much shorter-lived in cultivation[200], growing better in dry areas with hot summers[200]. Western Britain is generally too cool and wet for this species to thrive[200]. Plants are usually monoecious but are sometimes dioecious. Male and female plants must usually be grown if seed and fruit is required. The fruit takes two summers to ripen[229]. Plants are resistant to honey fungus[88]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

### 5.2.163 Vitis labruscana

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 15 m hkuc hmimhtt cyuti kyucutcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis labruscana is a deciduous Climber growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light

woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[11, 177]. A 'foxy' flavour that is not normally relished in Europe[11]. However, the fruit is larger and less 'foxy' than *V. labrusca*[11]. The fruit is about 25mm in diameter[200] and is carried in fairly large bunches. The fruit is commonly used for making wine in N. America[11]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168]. Greenish-blue and dark blue dyes can be obtained from the fruit skins of the cultivar 'Concord'[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. This is a hybrid species and so seed is unlikely to breed true. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Cultivated for its edible fruits, used mainly for making wine, in Eastern N. America[11]. There are many named varieties. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.164 Vitis labrusca

Northern Fox Grape, Fox grape

4 tin 9 cyuc 3 kcaak 2 tcan 1 dwat 15 m hkuc hmimhtt cyuti kyucutcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis labrusca is a deciduous Climber growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit Leaves Oil Sap ShootsEdibl Uses: OilFruit - raw or dried for winter use[1, 2, 46, 61, 161]. The fruit can also be made into pies, preserves etc[183]. A distinctive musky aroma and taste that is not acceptable to many people[11, 183, 200]. The fruit is best after a frost[101]. Sweetish[43], it contains 6.6 - 16.6% sugars[179]. The fruit is up to 2cm in diameter[200] and is produced in fairly large bunches[235]. Young leaves - cooked[55, 159]. A pleasant acid flavour, they are cooked as greens or can be wrapped around other foods and then baked, when they impart a pleasant flavour[183]. Young tendrils - raw or cooked[55, 85, 159]. Sap. Best harvested in the spring or early summer, it has a sweet flavour and makes a pleasant drink[101]. The sap should not be harvested in quantity or it will weaken the plant[K]. An oil is obtained from the seed[46, 61]. This would only really be a viable crop if large quantities of grapes were being grown for wine.

tcanta Dye Miscellany Oil RootstockA yellow dye is obtained from the fresh or dried leaves[168]. The plant is used as a rootstock for the common grape, *V. vinifera*, especially in areas where phylloxera disease is prevalent[61].

dwatta Miscellany Poultice UrinaryThe leaves are hepatic[257]. An infusion has been used in the treatment of diarrhoea, hepatitis, stomach aches, fevers, headaches and thrush[222, 257]. Externally, the leaves are poulticed and applied to sore breasts, rheumatic joints and headaches[222, 257]. The wilted leaves have been applied as a poultice to the breasts to draw away soreness after the birth of a child[257]. An infusion of the bark has been used to treat urinary complaints[257].

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182], they grow particularly well into elm trees[18]. The flowers have the sweet scent of mignonette[245]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Cultivated for its edible fruit in N. America, where it can produce yields of up to 17 tonnes per hectare[183]. It is the parent of several named varieties[1, 43, 183]. However, it is of no value as a fruit bearer in Britain, requiring hotter summers than are usually experienced in this country in order to ripen its fruit[11]. Another report says that this species is of interest for its hardiness and its ability to produce crops in cooler climates[200]. Resistant to Phylloxera disease, a disease that almost destroyed the European grape crops. This species can be used as a rootstock in areas where the disease is prevalent[61] and can also be used in breeding programmes with *V. vinifera* in order to impart resistance to that species[183]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 5.2.165 Morus rubra

Red Mulberry, Common Mulberry, White Mulberry  
4 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 15 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli nyanhjen hjonli

drutta Morus rubra is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kakta Edible Parts: Fruit Leaves ShootsEdible Uses: Fruit - raw, cooked or made into preserves[2, 3, 21, 62, 149, 183]. Large and sweet with a good flavour, the fruit can be up to 3cm long[200]. The fruit can also be dried and ground into a powder[183]. This is used to make a delicious confection with almonds and other nuts[183]. The fruit is soft and juicy, when fully ripe it falls from the tree and is easily squashed[227]. Unripe fruits can cause stomach disorders[226]. Young shoots and unfolding leaves - raw or

cooked. The related White Mulberry (*Morus alba*) has edible young leaves and shoots eaten cooked[105, 183] but we have found no information for this plant.

tcanta Fibre WoodA cloth can be made from the fibrous bark[149]. Wood - coarse-grained, light, very durable, not strong, soft, rather tough. It weighs about 45lb per cubic foot and is used for boats, fencing and cooperage[46, 61, 82, 227, 229].

dwatta Anthelmintic Cathartic Dysentery FebrifugeThe root bark is anthelmintic and cathartic[21]. A tea made from the roots has been used in the treatment of weakness, difficult urination, dysentery, tapeworms and as a panacea[222, 257]. The sap is used in the treatment of ringworm[222, 257]. Another report says that the milky juice obtained from the axis of the leaf is used[21]. The fruits are used to reduce fevers[222].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Landscape Uses:Pest tolerant, Aggressive surface roots possible, Pollard. Prefers a warm well-drained loamy soil in a sunny position[1, 11]. The red mulberry is sometimes cultivated for its edible fruit, there are some named varieties[183]. It is said to be of no value as a fruiting tree in Britain[1, 11]. Trees come into bearing when about 10 years old, fruiting best between the ages of 30 - 85 years and declining from the age of 125 years[227]. A good plant to grow grapes into. The grapes are difficult to pick but they always seem to be healthier and free from fungal diseases[201]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious[229] Male and female plants must be grown if fruit is required. Special Features: Not North American native, Naturalizing, There are no flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.166 Hydrangea anomala

Hydrangea

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 12 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli xre7t hjonli

drutta Hydrangea anomala is a deciduous Climber growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable

sow - sometimes to the point of nuisance[245].

## 5.2.255 Symphytum asperum

Prickly Comfrey

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Symphytum asperum is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kakta Edible Parts: LeavesEdible Uses: Gum TeaThe following reports are for *S. officinale*, they are said to also apply to this species[200]. Young leaves - cooked or raw[2, 4, 5, 9, 46, 61]. The leaf is hairy and the texture is mucilaginous. It may be full of minerals but it is not pleasant eating for most tastes. It can be chopped up finely and added to salads, in this way the hairiness is not so obvious[183]. Young shoots can be used as an asparagus substitute[46]. The blanched stalks are used[183]. Older leaves can be dried and used as a tea[26]. The peeled roots are cut up and added to soups[183]. A tea is made from the dried leaves and roots[183]. The roasted roots are used with dandelion and chicory roots for making coffee[183].

tcanta Biomass Compost GumThe following reports are for *S. officinale*, they are said to also apply to this species[200]. The plant grows very quickly, producing a lot of bulk. It is tolerant of being cut several times a year and can be used to provide 'instant compost' for crops such as potatoes. Simply layer the wilted leaves at the bottom of the potato trench or apply them as a mulch in no-dig gardens. A liquid feed can be obtained by soaking the leaves in a small amount of water for a week, excellent for potassium demanding crops such as tomatoes. The leaves are also a very valuable addition to the compost heap[26, 200]. A gum obtained from the roots was at one time used in the treatment of wool before it was spun[100].

dwatta Anodyne Astringent Demulcent Emollient Expectorant Haemostatic Refrigerant VulneraryThe leaves are anodyne, mildly astringent, demulcent, emollient, expectorant, haemostatic, refrigerant and vulnerary. They are used as an external poultice in the treatment of cuts, bruises and sprains. Internally, they are used as a tea in the treatment of chest complaints. The plant contains a substance called 'allantoin', a cell proliferant that speeds up the healing process[4, 21, 26, 165]. The leaves are harvested in the summer and can be used fresh or dried.

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta Tolerates moist soils and situations but prefers a moist soil and some shade[1, 4]. Grows well in heavy clay soils. Best grown in an open sunny site in a deep rich soil if it is being grown for compost material[200]. Plants can be invasive, often spreading freely by means of self-sown seed. They are also very difficult to remove, the root system is very deep and even small fragments of root left in the soil can produce new plants.

## 5.2.256 Silphium integrifolium

Prairie Rosinweed

4 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 1.8 m hkuc

htut cyutli hgatkyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Silphium integrifolium is a PERENNIAL growing to 1.8 m (6ft) by 0.9 m (3ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kakta Edible Parts: OilEdible Uses: OilCarbon Farming Solutions - Staple Crop: protein-oil (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1]. Under development at the Land Institute to domesticate this species for use as an oilseed crop. Trials yielded 1.1t/ha of seed [1-1].

tcanta OilGarden Ornamental. Compared to other Silphium species, it is shorter, less likely to topple over, and faster from seed to flower. More manageable than most perennial sunflowers as it spreads slowly, and it is not known to be allelopathic. Adapts well to prairies, wildflower/native plant gardens, naturalized areas, meadows or moist, open woodland areas. Attracts birds and butterflies

dwatta Native American peoples used the roots to treat pain from injuries [4].

propta Seed. Plants may be slow to establish in the garden, particularly when grown from seed. Plants often self-seed in optimum growing conditions. Plants develop taproots. Once established, division is not recommended.

nwatta Management: Standard Staple Crop: Protein-oil Under DevelopmentClimate: boreal to warm temperate. Humidity: semi-arid to humid. It needs full sun, poor to loamy soils, and mesic to dry conditions. Average, medium moisture, well-drained soils. Tolerates some light shade. Also tolerates some drought once established. Will grow in a variety of soils including sandy, loamy or clay ones. Cultivation: under development. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.257 Lilium canadense flavum

Meadow Lily

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lilium canadense flavum is a BULB growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kakta Edible Parts: RootEdible Uses: Bulb - cooked[2, 105, 177]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). The taste is rather like raw green corn on the ear[207]. The bulb can be dried, ground into a powder and used in making bread etc[257]. A famine food, only used when better foods are not available[257]. The bulb is up to 5cm in diameter[235].

tcanta None known

dwatta None known

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in

25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta An easily grown plant, succeeding in sun or part shade in any fertile soil[233]. Prefers a good deep loam and a semi-shady position[1, 111, 134]. Requires a sheltered position[1]. Plants are harder when grown in poorer soils[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Grows well by water[111]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.253 Sporobolus cryptandrus

Sand Dropseed

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sporobolus cryptandrus is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[257]. It can be parched, ground into a flour and eaten dry or made into a mush[61, 101, 105, 183]. The ground seed can also be added to biscuits, breads and other cereal concoctions[183, 257]. The tiny seed is easily freed from its husks[183].

tcanta Brush Soil reclamationA bunch of the grass, about 30cm long, can be tied together with string and used as a brush for cleaning[257].

dwatta None known

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination should take place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer if they have grown sufficiently. Otherwise, grow them on in a greenhouse for their first winter and plant them out in late spring of the following year. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any well drained soil in a sunny position[200].

### 5.2.254 Angelica archangelica

Angelica, Norwegian angelica

4 tin 8 cyuc 3 kcaak 0 tcan 3 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli fyixre7t hjonli

drutta Angelica archangelica is a BIENNIAL growing to 1.5 m (5ft) by 0.8 m (2ft 7in). See above for USDA hardi-

ness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Seed StemEdible Uses: CondimentLeaves - raw or cooked[2, 4, 14, 27, 37, 52]. A liquorice-like flavour[183], they can be used as a flavouring in mixed salads[K]. They are also used to sweeten tart fruits[K]. Stalks and young shoots - cooked or raw[2, 37]. The stalks should be peeled[115], they can be used like celery[183]. They can also be used to sweeten tart fruits[52] and to make jam[244]. They are often crystallised in sugar and used as sweets and cake decorations[244]. The stems are best harvested in the spring[244]. An essential oil is obtained from the root and seeds, it is used as a food flavouring[46, 57, 100, 183]. Root - cooked[2]. Seed - used as a flavouring in liqueurs such as Chartreuse[244]. A tea can be made from the leaves, seed or roots[183].

tcanta EssentialAn essential oil from the root and seeds is used in perfumery, medicinally and as a food flavouring[4, 46, 57, 100]. The oil from the seeds has a musk-like aroma and is often used to flavour liqueurs[245]. The dried root contains 0.35% essential oil, the seed about 1.3%[240]. Yields of the essential oil vary according to location, plants growing at higher altitudes have higher yields with a better aroma[240].

dwatta Antispasmodic Appetizer Carminative Diaphoretic Diuretic Expectorant Stimulant Stomachic Tonic UrinaryAngelica has a long folk-history of use as a medicinal herb, in particular for the treatment of digestive disorders and problems with blood circulation[4, 254]. The root is the most active medicinally, it should be harvested in the autumn of its first year of growth, sliced longitudinally if necessary and dried quickly[4]. If well stored, the root retains its medicinal virtues for many years[4]. The leaves and seeds can also be used[4]. The leaves are harvested and dried in late spring before the plant comes into flower[244]. The plant is antispasmodic, carminative, diaphoretic, diuretic, expectorant, stimulant, stomachic, tonic[4, 9, 14, 21, 46, 165]. An infusion is used to ease flatulence, indigestion, chronic bronchitis and typhus[244]. It stimulates blood flow to the peripheral parts of the body and so is of value in treating poor circulation - it is considered a specific treatment for Buerger's disease, a condition that narrows the arteries of the hands and feet[254]. Angelica is contra-indicated for people with a tendency towards diabetes since its use can increase sugar levels in the urine[4]. This plant should not be prescribed for pregnant women[238], nor should the juice be allowed to come into contact with the eyes[244]. An essential oil from the seeds is sometimes used as a rub to relieve rheumatic conditions[244]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Angelica archangelica fruit for fevers and colds, infection of the urinary tract, dyspeptic complaints and loss of appetite. The root has been approved for dyspeptic complaints and loss of appetite. (see [302] for critics of commission E). No health hazards or side-effects if the proper administration of therapeutic dosages. Avoid sunbathing and intensive UV radiation for the duration of a treatment [301].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[52, 200]. Tolerates a pH in the range 4.5 to 7.3. A very hardy plant, tolerating severe frosts without damage[4]. Although by nature biennial, the plants are reliably perennial if they are prevented from setting seed[200]. Angelica is occasionally cultivated in the herb garden, mainly for its culinary uses[46]. The plants have a pervading aromatic odour[4]. The growing plant is almost untroubled by pests and diseases[4]. It attracts bees and hoverflies in the garden, helping to create a natural balance of insect pests and predators[24]. When well-sited, the plant will often self-

for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves SapEdible Uses: Condiment SweetenerLeaves - cooked. A cucumber taste[183]. The Japanese crush the leaves and use them fresh with miso[177, 183]. A boiled concoction of the leaves is used to make a syrup[177, 183]. The sweet sap is used as a drink[183].

tcanta PaperThe bark is a paper substitute[146, 158]. The sub-species *H. anomala petiolaris* can be used as a ground cover plant in a shady position[188]. It is best spaced about 1.8 metres apart each way[208].

dwatta The leaves are used medicinally[266]. No further information is given.

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Basal softwood cuttings of non-flowering shoots[200]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Landscape Uses:Arbor, Espalier. Tolerates most soils[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Does well on very acid soils with a pH around 4.5[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil. Although the dormant plant is quite hardy in Britain, the young growth in spring can be damaged by late frosts. A fast-growing self-clinging climbing plant[208], attaching itself by means of aerial roots[200], and growing up walls or tree trunks on any aspect. The plants may need initial support, however[200]. Plants are growing well on a wall at Kew[11]. Grows well on north walls but prefers a sunnier position[208]. Closely related to *H. petiolaris*[11]. *H. petiolaris* is normally treated as no more than a sub-species of this species[200]. This species is notably susceptible to honey fungus[200]. Special Features: Not North American native, Blooms are very showy.

### 5.2.167 Sorbopyrus auricularis

Bollwyller Pear

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sorbopyrus auricularis is a deciduous Tree growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from May to November, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. The fruit has a dry and sweet yellowish flesh[11, 200]. Rather like a small pear, it has a very nice flavour when fully ripe[K]. The fruit is up to 5cm long[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe if this is possible, otherwise in late winter. The plant produces very little fertile seed, and this does not breed true[200], though some interesting plants might be produced[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer,

after the last expected frosts. Grafting is the best method of propagating this plant. This is best carried out in early spring, though budding can be carried out in the summer.

nwatta Succeeds in a well-drained moisture-retentive soil in an open sunny position[200]. Succeeds in light shade but fruits less well in such a position. This species is a bigeneric hybrid of garden origin between *Sorbus aria* and *Pyrus communis*[183].

### 5.2.168 Viburnum rufidulum

Southern Black Haw, Rusty blackhaw

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum rufidulum is a deciduous Shrub growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. The fleshy fruit has a sweet taste, somewhat like raisins[274], but it is nearly all seed[43, 159]. The taste is best after a frost. The ellipsoid fruit is up to 15mm long and contains a single large seed[229].

tcanta WoodWood - fine-grained, heavy, hard, strong, with a disagreeable odour[227]. Of no particular value[227].

dwatta AntispasmodicThe bark is antispasmodic and has been used in the treatment of cramps and colic[254].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. A fast-growing but short-lived species in the wild[229]. Plants grow well but do not flower very freely in Britain[11]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200].

### 5.2.169 Cercis canadensis

Redbud, Eastern redbud, Mexican redbud,Texas redbud

4 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatpriklwis hpa7tmwatli xre7t hjonli

drutta Cercis canadensis is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen in

October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Seedpod**Edible Uses:** CondimentFlowers - raw[46, 61, 94, 183] or pickled[2, 105, 149]. A nice refreshing acid taste, the flowers are rich in vitamin C and make a pleasant addition to salads[183, K]. They can also be used as a condiment[200]. The unopened buds are pickled or used as a caper substitute[183]. On a zero moisture basis, the seed contains 22.9 - 27.5% protein, 7.7 - 8.8% fat and 3% ash[218]. (This report does not say if the seed is edible[K]). There is some evidence that both the young seed pods (eaten like snow peas) and the young leaves can be eaten.

**tcanta Basketry Wood**The bark of young shoots is used in basket making[94, 106]. Wood - heavy, hard, not strong, close grained, takes a very fine polish[82, 94]. It weighs 40lb per cubic foot[235].

**dwatta Astringent Cancer Dysentery Febrifuge Pectoral Vitamin C** Tea made from the inner bark is highly astringent[46, 61, 94, 149, 222]. Used in the treatment of fevers, diarrhoea and dysentery, it is also a folk remedy for leukaemia[222]. A cold infusion of the roots and inner bark have been used to treat various chest complaints including whooping cough and congestion[257].

**propta Seed** - best sown as soon as it is ripe in a cold frame[200]. Pre-soak stored seed for 24 hours in warm water then cold stratify for 3 months[113]. Sow spring in the greenhouse[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants resent root disturbance and are best planted out in their permanent positions as soon as possible[11]. Cuttings of half-ripe wood, July/August in a frame[200].

**nwatta Landscape Uses:**Border, Standard, Specimen, Street tree, Woodland garden. Succeeds in most soils and pH types, but dislikes growing in wet soils, especially when these are of clay[200]. Prefers a deep sandy loam and a very sunny position[11, 98, 182]. Succeeds in light shade[200]. Dislikes drought[200]. Although the dormant plant is cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A fast-growing but short-lived tree in the wild[229]. It does not flower freely in Britain[188]. There is at least one named form, selected for its ornamental value[188]. This species is the state tree of Oklahoma[274]. The flowers are produced on the branches of the previous or earlier years, and also on the trunk of the plant[82]. Plants are susceptible to coral spot fungus, especially when growing in areas with cooler summers where the wood is not fully ripened[11]. Plants in this genus are notably resistant to honey fungus[200]. A good bee plant[149]. Resents root disturbance, plants should be planted into their permanent positions as soon as possible, preferably in May, and should be kept well watered until established[11, 188]. This species is one of the few members of the family Leguminosae that do not fix atmospheric nitrogen[226]. **Special Features:**North American native, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 9 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.170 Sorbus aria

**Whitebeam, Chess-apple**  
4 tin 8 cyuc 3 kcaak 4 tcan 1 dwat 12 m hkuc  
hmmihhut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli frusflat-prikhwisslip hpa7tmwatli xre7t hjonli

**drutta Sorbus aria** is a deciduous Tree growing to 12 m (39ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked and used in preserves etc. The fruit is usually bletted if it is going to be eaten raw[2, 3, 5, 105, 115, 183]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit[K]. Fruit from some trees has a pleasant mild flavour and a mealy texture, we like eating small quantities of it. The fruit can also be dried and ground into a powder and mixed with cereals such as wheat[2, 46, 66]. The fruit is about 10 - 12mm across[200].

**tcanta Pioneer Shelterbelt Wood**Very tolerant of exposed maritime conditions, it makes a good windbreak tree near the coast[75, 200]. A useful pioneer species, especially on chalky soils and in windy situations[186, K]. Wood - hard, heavy, close grained. Used for beams etc[11, 115].

**dwatta Diuretic Emmenagogue Laxative**Both the flowers and the fruit are mildly diuretic, laxative and emmenagogue[9]. An infusion is used in the treatment of painful menstruation, constipation and kidney disorders[9].

**propta Seed** - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

**nwatta Succeeds** in most reasonably good soils in an open sunny position[11]. Tolerates acid sands and thin chalky soils[98, 200]. Does well on heavy clays[200]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Very tolerant of atmospheric pollution and of exposed maritime positions[186]. The whitebeam is one of the first colonizers of chalk scrub[186]. As well as being a good pioneer species for this situation, it will often survive through the development to woodland[186]. There are several named varieties selected for their ornamental value[188]. Trees cast a fairly dense shade when mature[186]. Regenerating well after cutting, it is suitable for coppicing[186]. The fruit is very attractive to birds[11]. Plants are susceptible to fire-blight[188]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.171 Smilax rotundifolia

**Horse Brier, Roundleaf greenbrier, Brambles**  
4 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 12 m hkuc  
hmmihhut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli nyanhjen hjonli

**drutta Smilax rotundifolia** is a deciduous Climber growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant

pie[183]. Cherry-like, a harsh sour taste[178]. A reasonable size, about 14mm in diameter with one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

**tcanta DyeA green dye** can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

**dwatta Aperient Carminative Demulcent Deobstruent Diuretic Lenitive Ophthalmic**The kernels are aperient, carminative, demulcent, deobstruent, diuretic, hypotensive, laxative, lenitive and ophthalmic[147, 176, 178, 218, 238]. They are taken internally in the treatment of dry constipation, oedema and insomnia following a trauma[238]. The root is used in the treatment of constipation, children's fever, pinworms and teeth ailments[218]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

**propta Seed** - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

**nwatta Thrives** in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Plants are hardy to at least -15°C[238]. A very ornamental plant[1], but it is subject to die-back[11]. Plants in this genus are notably susceptible to honey fungus[200]. The Korean cherry is sometimes cultivated for its edible fruit, there is at least one named variety[183]. The sub-species *P. japonica nakai*. (Lév.)Rehd., which comes from Manchuria, has larger plum-like fruits up to 50mm in diameter[200]. This species is closely related to *P. glandulosa*[11, 58]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238].

## 5.2.251 Berberis canadensis

**Allegheny Barberry, American barberry**  
4 tin 8 cyuc 3 kcaak 1 tcan 2 dwat 1 y 8 m hkuc  
hmmihhut cyutli kyuctup hwicli hy8hrasjlutnyikfrip hpa7tli flatprikhwis hpa7tmwatli fyfuxre7t hjonli

**drutta Berberis canadensis** is a deciduous Shrub growing to 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Fruit Leaves**Edible Uses:** Fruit - raw or cooked. Agreeably acid[2, 22, 46, 95, 161], they are an acceptable raw fruit in small quantities but are more commonly used in preserves[177, K]. The fruits are about 9mm long[200]. Leaves - raw. A trailside nibble[102]. Flowers[102]. No more details.

**tcanta DyeA yellow dye** is obtained from the root.  
**dwatta Antibacterial Cancer Dysentery**Berberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. A tea made from the roots is used in the treatment of fevers and diarrhoea[222].

**propta Seed** - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

**nwatta Prefers** a warm moist loamy soil but is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. The plant is an alternate host of 'black stem rust' of cereals and so it is often grubbed out when growing wild in cereal-producing areas. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely and resprout well from the base[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 5.2.252 Aralia racemosa

**American Spikenard**  
4 tin 8 cyuc 3 kcaak 2 tcan 3 dwat 1.8 m hkuc  
pcimhmm cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

**drutta Aralia racemosa** is a PERENNIAL growing to 1.8 m (6ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Fruit Leaves Root**Edible Uses:** CondimentYoung shoot tips - cooked[161]. Used as a pot herb[207] or as a flavouring in soups[257]. Root - cooked. Large and spicy, it is used in soups[43, 105, 161, 177]. Pleasantly aromatic, imparting a liquorice-like flavour[183]. A substitute for sarsaparilla (*Smilax* spp.)[200], it is also used in making 'root beer'[183]. Fruit - raw or cooked[207]. Pleasant and wholesome to eat[207]. They can be made into a jelly[183, 207]. The fruit is about 4mm in diameter[200]. The roots have an aroma. The fruit are purple-brown [1-4].

**tcanta A specialist nectary plant** [1-2].

**dwatta Alternative Antirheumatic Diaphoretic Eczema Expectorant Poulitice Skin Stimulant**American spikenard is a sweet pungent tonic herb that is often used in modern herbalism where it acts as an alterative[238]. It had a wide range of traditional uses amongst the North American Indians and was at one time widely used as a substitute for the tropical medicinal herb sarsaparilla[222, 257]. The root is alterative, diaphoretic, diuretic, pectoral and stimulant[4, 21, 46, 222]. The herb encourages sweating, is stimulating and detoxifying and so is used internally in the treatment of pulmonary diseases, asthma, rheumatism etc[4, 213, 238, 254]. Externally it is used as a poultice in treating rheumatism and skin problems such as eczema[4, 213, 238, 254]. The root is collected in late summer and the autumn and dried for later use[4, 213]. A drink made from the pulverised roots is used as a cough treatment[213]. A poultice made from the roots and/or the fruit is applied to sores, burns, itchy skin, ulcers, swellings etc[213, 222].

**propta Seed** - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are



can be grown as a low hedge and does not need trimming. Because of its suckering habit, it also makes a good dense ground cover plant though it can be slow to become established[197, 200].

dwatta Alternative Antibacterial Antipsoriatic Antiseborrheic Antitumor Blood Tonic Cholagogue Diuretic Dysentery Laxative Ophthalmic TonicOregon grape was often used by several native North American Indian tribes to treat loss of appetite and debility[254]. Its current herbal use is mainly in the treatment of gastritis and general digestive weakness, to stimulate the kidney and gallbladder function and to reduce catarrhal problems[254, 257]. The root and root bark is alternative, blood tonic, cholagogue, diuretic, laxative and tonic[4, 21, 165, 257]. It improves the digestion and absorption and is taken internally in the treatment of psoriasis, syphilis, haemorrhages, stomach complaints and impure blood conditions[4, 238]. Externally, it has been used as a gargle for sore throats and as a wash for blurry or blood-shot eyes[257]. The roots are harvested in late autumn or early spring and dried for later use[238]. The fruit is an excellent gentle and safe laxative[257]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta Landscape Uses:Border, Foundation, Pest tolerant, Massing, Specimen, Woodland garden. A very easy plant to grow, thriving in any good garden soil[11, 200] and tolerating dense shade under trees[1, 28]. It grows well in heavy clay soils and also succeeds in dry soils if it is given a good mulch annually[197]. It dislikes exposure to strong winds[K]. Plants are hardy to about -20°C[184]. Very tolerant of pruning, plants can be cut back into old wood if they grow too large and straggly[238]. Spring is the best time to do this[238]. Suckers are fairly freely produced, with established plants forming dense thickets[200]. Most plants grown under this name are casual hybrids with *M. repens*[67]. This species is easily confused with *M. pinata*[67], with which it also hybridizes[200]. The flowers are delicately scented[245]. A number of named forms have been developed for their ornamental value[182]. This species is notably resistant to honey fungus[88, 200]. This plant is the state flower of Oregon[95]. Special Features: North American native, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.249 Ribes lacustre

Prickly Blackcurrant, Prickly currant  
4 tlin 8 cyuc 3 kcaak 2 tcan 1 dwat 1.5 m hkuc  
hmmihhut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Ribes lacustre is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 85, 101, 257]. Tart and very juicy[183]. The fully ripe fruit has an agreeable flavour[256]. When crushed the fruit has a foul odour[43] but when eaten by the handful the odour is inoffensive (this sounds a bit strange!) and when cooked they make a good sauce[183]. The fruit can also be dried for later use or used to make jams and preserves[257]. The fruit is about 5mm in diameter[200] and is covered with weak gland-tipped bristles[235].

tcanta Needles StringThe roots have been boiled with cedar (*Juniperus* spp, Thuja sp.) and wild rose (*Rosa* spp) roots, then pounded and woven into rope[257]. The sharp thorns have been used as probes for boils, for removing splinters and for tattooing[257].

dwatta Analgesic Birthing aid Laxative Ophthalmic StomachicThe leaves or the bark can be chewed and then placed on sores caused by the prickles of this plant[257]. A decoction of the bark has been used as a wash for sore eyes[257]. The decoction has also been taken by women during labour to ease the birth[257]. A decoction of the root can be taken several times a day as a treatment for constipation[257]. A decoction of the twigs has been taken in the treatment of general body aches[257]. A decoction of dried branches has been used in the treatment of stomach complaints, diarrhoea and colds[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 6 months cold stratification at about 0°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°C[200]. Although this plant has spines, it belongs to the blackcurrant section of the genus[101]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.250 Prunus japonica

Korean Cherry, Japanese bush cherry  
4 tlin 8 cyuc 3 kcaak 1 tcan 3 dwat 1.5 m hkuc  
hmmihhut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Prunus japonica is an evergreen Shrub growing to 1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked. A sweet agreeable flavour, they make a good

so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Drink-Root - cooked[2, 102, 161, 257]. Rich in starch[105]. The root can be dried and ground into a powder that is used in making cakes, puddings, sweet drinks etc[46, 183], it can also be made into a jelly or eaten in soups[159]. A beer resembling root beer or sarsaparilla is made from the roots[183]. Young shoots - raw or cooked[62, 102, 105, 159]. They can be added to salads or cooked like asparagus[183].

tcanta None known  
dwatta Birthing aid Poultice RubefacientThe stem prickles have been rubbed on the skin as a counter-irritant to relieve localised pains, muscle cramps and twitching[222]. A tea made from the leaves and stems has been used in the treatment of rheumatism and stomach problems[222]. The parched and powdered leaves have been used as a dressing on burns and scalds[257]. The wilted leaves have been used as a poultice on boils[222, 257]. A tea made from the roots is used to help the expelling of afterbirth[222]. Reports that the roots contain the hormone testosterone have not been confirmed, they might contain steroid precursors, however[222].

propta Seed - sow March in a warm greenhouse[1]. This note probably refers to the tropical members of the genus, seeds of plants from cooler areas seem to require a period of cold stratification, some species taking 2 or more years to germinate[K]. We sow the seed of temperate species in a cold frame as soon as we receive it, and would sow the seed as soon as it is ripe if we could obtain it then[K]. When the seedlings eventually germinate, prick them out into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first year, though we normally grow them on in pots for 2 years. Plant them out into their permanent positions in early summer. Division in early spring as new growth begins[238]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings of half-ripe shoots, July in a frame[238].

nwatta Succeeds in most soils in sun or semi-shade[1, 200]. A very free growing plant, it can be used to clamber over large trees, shrubs or tree stumps[1, 200]. Hardy to about -20°C[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features:North American native, Invasive, Naturalizing, Attractive flowers or blooms.

## 5.2.172 Taxus cuspidata

Japanese Yew  
4 tlin 7 cyuc 3 kcaak 2 tcan 4 dwat 10 m hkuc  
pcimhmmihhut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli  
frusflatprikliwislip hpa7tmwatli nyanhjen hjonli

drutta Taxus cuspidata is an evergreen Tree growing to 10 m (32ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or made into jam[105, 183]. Very sweet and gelatinous, most people find it delicious though some find it sickly. The fruit is a fleshy berry about 8mm in diameter and containing a single seed[200]. All other parts of this plant, including the seed, are highly poisonous. When eating the fruit you should spit out the large seed found in the fruit's centre. Should you swallow the whole seed it will just pass straight through you

without harm, if the seed has been bitten into, however, it could cause some problems.

tcanta Dye WoodA brown dye is obtained from the heart-wood[46, 61]. Red according to another report[266]. An oil is extracted from the seeds[266]. Wood - hard, strong, elastic, fine grained, takes a beautiful polish. Used for furniture, bows etc[1, 46, 61]. The wood is used in building construction, furniture manufacture and as a carving material[266].

dwatta CancerModern research has shown that yew trees contain the substance 'taxol' in their shoots and bark. Taxol has shown exciting potential as an anti-cancer drug, particularly in the treatment of ovarian cancers[218, 238]. This remedy is very toxic and, even when used externally, should only be used under the supervision of a qualified practitioner[238]. See also the notes above on toxicity. A compound used to treat diabetes is extracted from the wood, bark, leaves, and roots[266].

propta Seed - can be very slow to germinate, often taking 2 or more years[78, 80]. It is best sown as soon as it is ripe in the autumn when it should germinate 18 months later. Stored seed may take 2 years or more to germinate. 4 months warm followed by 4 months cold stratification may help reduce the germination time[113]. Harvesting the seed 'green' (when fully developed but before it has dried on the plant) and then sowing it immediately has not been found to reduce the germination time because the inhibiting factors develop too early[80]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in pots in a cold frame. The seedlings are very slow-growing and will probably require at least 2 years of pot cultivation before being large enough to plant out. Any planting out is best done in late spring or early summer, after the last expected frosts[K]. Cuttings of half-ripe terminal shoots, 5 - 8cm long, July/August in a shaded frame. Should root by late September but leave them in the frame over winter and plant out in late spring[78]. High percentage[11]. Cuttings of ripe terminal shoots, taken in winter after a hard frost, in a shaded frame[113].

nwatta Landscape Uses:Hedge, Screen, Superior hedge, Specimen. Thrives in almost any soil, acid or alkaline, as long as it is well-drained[1, 200]. Succeeds in dry soils[188]. Very shade tolerant[81]. The dormant plant is hardy to about -35°C[200] but it requires more summer heat and humidity than *T. baccata* and is rarely more than a shrub in Britain[81]. Young shoots can be damaged by late spring frosts. The foliage may turn reddish-brown in cold winters[81]. There are several named varieties selected for their ornamental value[188]. Plants produce very little fibrous root and should be planted in their final positions when still small[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if fruit and seed is required. Female plants fruit freely in Britain if they are pollinated[11, 185]. Special Features:Not North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms.

## 5.2.173 Sorbopyrus species

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc  
hmmihhut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta Sorbopyrus species is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from May to November, in flower in April, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Fruit - raw or cooked[183].  
tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe if this is possible, otherwise in late winter. The plant produces very little fertile seed, and this does not breed true[200], though some interesting plants might be produced[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into

their permanent positions in late spring or early summer, after the last expected frosts. Grafting is the best method of propagating this plant. This is best carried out in early spring, though budding can be carried out in the summer.

nwatta Succeds in a well-drained moisture-retentive soil in an open sunny position[200]. Succeds in light shade but fruits less well in such a position. This species is a bi-generic hybrid of garden origin between a Sorbus species and Pyrus communis[183].

## 5.2.174 Crataegus punctata

Dotted Hawthorn,

4 tlin 8 cyuc 3 kcaak 2 tcan 2 dwat 10 m hkuc hmimhtut cyutli hgattcuphja7n hwicli brasljutnyikfrrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus punctata is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[159]. Eaten out of hand or made into jellies, preserves etc[177, 183]. A good size, about 25mm in diameter, and borne in small clusters[200]. Ripening in October, it is quite apple-like in texture and appearance, making a good dessert fruit[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta MiscellanyWood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic Hypotensive MiscellanyA compound decoction of the shoots and bark has been used to stop menstrual flow[257]. Although no other specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit,

they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant[1], it grows very well in Britain, flowering and fruiting abundantly[11]. There are some named varieties selected for their ornamental value[200]. 'Ohio Pioneer' is a thornless form growing about 8 metres tall[200]. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.175 Malus sylvestris

Crab Apple, European crab apple  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hasrajlutnyikfrrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Malus sylvestris is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit OilEdible Uses: Oil Pectin Pectin TeaFruit - raw or cooked[9, 15]. Used for jellies, preserves and juices[183]. The flavour improves considerably if the fruit is not harvested until it has been frosted[12]. The fruit is quite variable in size (it is about 2 - 4cm in diameter[200]) and quality. Whilst usually harsh and acid, some forms are quite sweet and can be eaten out of hand[K]. The fruit is rich in pectin and can be used in helping other fruits to set when making jam etc[61, 142]. Pectin is also said to protect the body against radiation[201]. An edible oil can be obtained from the seed[4]. It would only really be viable to use these seeds as an oil source if the fruit was being used for some purpose such as making cider and then the seeds could be extracted from the remaining pulp[K]. A very pleasant tea can be made from the leaves[7].

tcanta Dye Fuel Oil Pectin PectinThe fruit is a source of pectin[61, 142]. Pectin is used as a thickener in jams etc and as a culture medium in laboratories. A red to yellow dye is obtained from the bark[257]. The wood is an excellent fuel[67].

dwatta Anthelmintic Antibacterial Astringent Hypnotic Laxative RefrigerantThe fruit is astringent and laxative[4, 9]. The crushed fruit pulp can be used as a poultice to heal inflammations or small flesh wounds[7]. The fruit is eaten to obviate constipation[240]. The bark, and especially the root bark, is anthelmintic, refrigerant and soporific[218, 240]. An infusion is used in the treatment of intermittent, remittent and bilious fevers[4, 240]. The leaves contain up to 2.4% of an antibacterial substance called 'florin'[240]. This inhibits the growth of a number of gram-positive and gram-negative bacteria in as low a concentration as 30 ppm[240].

Petals - raw. The petals are pleasantly aromatic, but you need to remove the bitter white base[172]. Young shoots - raw or cooked. Peeled and eaten in spring when they are still tender[101, 172, 177, 183, 257]. The seed is a good source of vitamin E, it can be ground and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102]. The peeled stems are used to make a beverage[257]. The leaves are used to make a tea[257].

tcanta Hedge HedgeThe plant makes a good informal hedge[1].

dwatta Analgesic Astringent Birthing aid Cancer Foot care Ophthalmic Stings Vitamin C Women's complaintsAn infusion of the roots and sprouts has been used as an eyewash for sore eyes[257]. A decoction of the roots has been used by women after giving birth and also in the treatment of sore throats[257]. A decoction of the bark has been taken to ease the labour pains of childbirth[257]. A poultice of the chewed leaves has been used to alleviate the pain of bee stings[257]. A decoction of the branches, combined with chokecherry (Prunus virginiana) and red willow (Salix bonplandiana), has been used in the treatment of various women's complaints, diarrhoea and vomiting[257]. The leaves have been placed in shoes as a protection from athletes foot[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeds in most soils[11], preferring a circumneutral soil and a sunny position[200]. Grows well in heavy clay soils. Prefers a slightly acid soil[14]. Dislikes water-logged soils[200]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. A very ornamental plant[1], it fruits well in Britain[11]. This plant is often wrongly grown under the name R. californica[200]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.247 Amelanchier spicata

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hasrajlutnyikfrrip hpa7tli flatprik hpa7tmwatli fyixre7t hjonli

drutta Amelanchier spicata is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and

female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked. Sweet and juicy[177, 183]. The fruit is rich in iron and copper[226]. It is rather small, about 8mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200], but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Plants are hardy to about -25°C[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Produces suckers freely, forming thickets. This species is closely related to A stolonifera[11], it is possibly a hybrid of A. canadensis x A stolonifera[177]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of A. lamarckii or Sorbus aucuparia is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 5.2.248 Mahonia aquifolium

Oregon Grape, Hollyleaved barberry, Oregon Holly Grape, Oregon Holly

4 tlin 8 cyuc 3 kcaak 3 tcan 3 dwat 2 m hkuc pimhmimhtut cyutli kyuctup hwicli hasrajlutnyikfrrip hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Mahonia aquifolium is an evergreen Shrub growing to 2 m (6ft) by 1.5 m (5ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5. It is in leaf all year, in flower from January to May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers FruitEdible Uses: Drink-Fruit - raw or cooked[2, 3, 5, 95]. The fruit is almost as large as a blackcurrant and is produced in large bunches so it is easy to harvest[K]. It has an acid flavour, but it is rather nice raw and is especially good when added to a porridge or muesli[K]. Unfortunately, there is relatively little flesh and a lot of seeds, though some plants have larger and juicier fruits[K]. The cooked fruit tastes somewhat like blackcurrants[K]. The fruit can also be dried and stored for later use[257]. Flowers - raw. They can also be used to make a lemonade-like drink[183].

tcanta Dye Hedge HedgeA yellow dye is obtained from the inner bark of the stem and roots[99, 101, 257]. It is green according to another report[168]. Dark green, violet and dark blue-purple dyes are obtained from the fruit[168]. A green dye is obtained from the leaves[168]. This species

## 5.2.244 Chenopodium giganteum

Tree Spinach

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 2.4 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Chenopodium giganteum is a ANNUAL growing to 2.4 m (7ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - cooked[46, 61, 105, 177]. Of excellent quality, they are a spinach substitute[74]. The raw leaves should only be eaten in small quantities, see the notes above on toxicity. Seed - cooked. Ground into a powder and used with wheat or other cereals in making bread etc. The seed is small and fiddly, about 1.5mm in diameter[266]. It should be soaked in water overnight and thoroughly rinsed before it is used in order to remove any saponins.

tcanta Dye WoodGold/green dyes can be obtained from the whole plant[168]. The stout stems have been used for making walking sticks[266].

dwatta None known

propta Seed - sow spring in situ. Most of the seed usually germinates within a few days of sowing.

nwatta An easily grown plant, succeeding in most soils but disliking shade[1, 200]. It prefers a moderately fertile soil[200]. This species is closely related to *C. album*[50], and was probably derived from it through cultivation[266]. The tree spinach is sometimes cultivated for its edible leaves[74], there are some named varieties[183]. ‘Magentaspreen’ is a vigorous plant growing 1.5 metres tall. It has large leaves, the new growth is a brilliant magenta colour. Tastiest when young, the leaves are eaten raw or cooked like spinach[183]. A warm climate is required in order to ripen the seed[74].

## 5.2.245 Artemisia tridentata

Sage Brush, Big sagebrush, Bonneville big sagebrush

4 tlin 10 cyuc 3 kcaak 5 tcan 2 dwat 2.5 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlut hpa7tli flatprikklwisslip hpa7tmwatli xre7t hjonli

drutta Artemisia tridentata is an EVERGREEN Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. It is in leaf all year, in flower in October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: Condiment TeaLeaves - cooked[61]. The subspecies *A. tridentata vaseyana* has a pleasant mint-like aroma whilst some other subspecies are very bitter and pungent[164]. The leaves are used as a condiment and to make a tea[257]. Seed - raw or cooked. Oily[46, 61]. It can be roasted then ground into a powder and mixed with water or eaten raw[84, 106, 161, 257]. The seed is very small and fiddly to use[K].

tcanta Basketry Disinfectant Dye Fibre Friction sticks Fuel Hair Miscellany Paper Repellent Stuffing TinderAn infusion of the leaves is used as a hair rinse, it treats dandruff and falling hair[84, 106, 168]. An infusion of the plant repels insects[99], it is also disinfectant and so is used for washing walls, floors etc[99]. A yellow to gold dye is obtained from the leaves, buds and stems combined[168]. The fibrous bark is used for weaving mats, baskets, cloth etc., or as a stuffing material in pillows etc and as an insulation in shoes to keep the feet warm[99, 257]. A fibre obtained from the inner bark is used for making paper[189]. The fibres are about 1.3mm long[189]. The stems are harvested in late summer, the leaves removed and the stems steamed until the fibre can be stripped off. The fibre is then cooked for two hours with lye before being ball milled for 4 hours. The resulting paper is a

light tan/gold colour[189]. A bunch of the leafy stems can be tied together and used as a broom[257]. The shredded bark is a fine tinder for starting fires[99, 257]. The stems make good friction sticks for making fires[257]. The seeds are used during celebrations because, when thrown into a fire, they explode like crackers[257]. Wood - hard, dense[229]. It burns rapidly and well, even when green, and has a pleasant aromatic smell[212]. Sagebrush provides food and habitat for a variety of species, such as sage grouse, pronghorn antelope, gray vireo, pygmy rabbit, and mule deer.

dwatta Antirheumatic Antiseptic Digestive Disinfectant Febrifuge Miscellany Ophthalmic Poultice Sedative SkinSage brush was widely employed by many native North American Indian tribes who used it to treat a wide range of disorders[257]. It is little used in modern herbalism, though it certainly merits further investigation[K]. The plant is antirheumatic, antiseptic, digestive, disinfectant, febrifuge, ophthalmic, poultice and sedative[46, 61, 99, 257]. A decoction of the leaves is used in the treatment of digestive disorders and sore throats[216, 257]. An infusion of the fresh or dried leaves is used to treat pneumonia, bad colds with coughing and bronchitis[257]. It is used both internally and externally in the treatment of rheumatism[257]. The crushed plant is used as a liniment on cuts, sores etc whilst a decoction of the leaves is used as an antiseptic wash for cuts, wounds and sores[257]. A poultice of the steeped leaves is applied to sore eyes[257]. The plant is burnt in the house in order to disinfect it[257].

propta Seed - surface sow from late winter to early summer in a greenhouse in a very free-draining soil, but making sure that the compost does not dry out. The sub-species *A. tridentata vaseyana* germinates better if given a cool stratification for 30 - 50 days. Other sub-species germinate in 1 - 2 weeks in a warm greenhouse[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter, planting them out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame. Very slow to root[11] Division in spring or autumn. Layering[164].

nwatta Requires a sunny position and a well-drained soil that is not too rich[1, 11]. Requires a lime-free soil[60]. There are a number of sub-species growing in different habitats from deep fertile soils to poor shallow ones[164]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Established plants are very drought tolerant[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The plant is very aromatic, especially after rain[11, 182]. The pollen of this species is one of the main causes of hayfever in N. America[212]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.246 Rosa nutkana

Nootka Rose, Bristly Nootka rose

4 tlin 8 cyuc 3 kcaak 4 tcan 2 dwat 2.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli fyifxre7t hjonli

drutta Rosa nutkana is a deciduous Shrub growing to 2.7 m (8ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit Seed StemEdible Uses: TeaFruit - raw or cooked[2, 101, 118, 161, 257]. The taste is best after a frost[172]. Juicy, pleasantly acid and a good source of vitamin C[183]. The fruit can be dried, powdered and added to tea as a flavouring or used in its own right as a fruity-flavoured tea[21, 101, 183]. The fruit is about 20mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards.

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, including heavy ones, preferring a moisture retentive well-drained loamy soil[1, 98, 200]. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[186, 200]. Fairly tolerant of cutting, it succeeds in a mixed hedgerow[186]. A parent of the cultivated apple[11], it is often used as a rootstock[50]. The fruit is a good wildlife food source, especially for birds[200]. The plant has over 90 associated insect species[24]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.176 Arundinaria spp

Running Bamboo

4 tlin 10 cyuc 3 kcaak 4 tcan 1 dwat 10 m hkuc pcmhimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli hjonli

drutta Arundinaria spp is an evergreen Bamboo growing to 10 m (32ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Seed ShootsEdible Uses: Young shoots - cooked[11, 22, 46, 105, 183]. Used as a pot-herb[236]. Seed - cooked[46, 61, 161]. It can be used as a wheat substitute[2, 105], for which it is not much inferior[213], but it is rather small and difficult to collect in quantity[159]. The plants only flower at irregular intervals of several years. See individual species for more information.

tcanta FodderAgroforestry Uses: With its extensive running root system, the plant is ideal for helping to control soil erosion, especially along the sides of rivers[352]. The extensive growth of the plant provides streambank stabilization, sediment retention, and bioaccumulation of nutrients and toxins[1050]. So long as it can be restrained, the plant makes an excellent, dense hedge or screen[352]. The canes are used as pipe-stems, are woven into baskets and mats plus a variety of other purposes[169, 236]. The hollow stems can be made into flutes[257]. Carbon Farming Solutions - Industrial Crop: biomass (Crops grown in non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Fodder: bank.

dwatta See individual species.

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. When large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded place in the greenhouse until large enough to plant out. Bamboos only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Rhizome cuttings. Basal cane cuttings.

nwatta Fodder: Bank Industrial Crop: Biomass Management Managed Multistem Minor Global CropThere are three rec-

ognized species of the genus *Arundinaria* accepted: *Arundinaria appalachiana* Triplett, Weakley and L.G.Clark - Hill cane, *Arundinaria gigantea* (Walt.) Muhl. - River cane, *Arundinaria tecta* Muhl. - Switch cane. Climate: cold to warm temperate. Humidity: humid. Carbon Farming Solutions - Managed bamboo forest sequester more carbon than wild bamboo and the same as fast-growing tropical trees like eucalyptus. Cultivation: minor global crop. Management: managed multistem (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.177 Pinus bungeana

Lace-Bark Pine, Bunge's pine

4 tlin 7 cyuc 3 kcaak 0 tcan 2 dwat 10 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlut hpa7tli flatprikklwis hpa7tmwatli dyat hjonli

drutta Pinus bungeana is an evergreen Tree growing to 10 m (32ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: CondimentSeed - raw or cooked[105, 177]. A reasonable size, being up to 10mm x 8mm[200]. The oil-rich seed has a resinous flavour. A vanilla flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye HerbicideA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc.

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. The method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of

the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Border, Pest tolerant, Rock garden, Specimen, Street tree. Prefers a deep loamy soil[20]. Thrives in a light well-drained sandy or gravelly loam[1]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought, succeeding in hot dry sites[200]. A very ornamental tree with beautiful bark. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species is slow growing and hard to establish in Britain, doing best in the mild areas of the country[120, 185]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 5.2.178 Sorbus lanata

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Sorbus lanata is a deciduous Tree growing to 10 m (32ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[272]. The fruit is usually bletted if it is going to be eaten raw[2, 51, 146, 158]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit[K]. The fruit is about 1.2 - 3cm across[200] and is borne in bunches which makes harvesting easier[K].

tcanta WoodWood - moderately hard, close and even grained, seasons well[146].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. This species grows best in S.W. England[121]. Plants are susceptible to fire-blight[188]. Closely related to *S. cuspidata*[121] and to *S. aria*[200].

### 5.2.179 Malus floribunda

Japanese Crab, Japanese flowering crab apple

4 tin 7 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfri hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Malus floribunda is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. Up to 1cm in diameter[200]. It tastes like a soft fruit. Acid but nice, about the size of a large blackcurrant[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta Landscape Uses:Border, Espalier, Pest tolerant, Standard, Specimen, Street tree. An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. A very ornamental plant[1], the fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. The tree is a very good pollinator for the apple orchard[200]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 5.2.180 Castanea mollissima

Chinese Chestnut

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat m hkuc

hmimhtut cyutli hqatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Castanea mollissima is a deciduous Tree growing to 25 m (82ft 0in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[46, 61, 63, 105]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K]. The skin (or pellicle) of the seed is easily peeled[183]. The seed is low in fats and oils but high in carbohydrates[183]. A nutritional analysis is available[218].

tcanta Fuel Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - hard, strong, light. Used for fence posts etc[11]. Coppiced for fuel.

dwatta Antidote Astringent Dysentery StomachicThe burrs (seed cases?) are rich in tannin and are astringent and stomachic[147, 218]. A decoction is used in the treatment of diarrhoea, uncontrollable nose bleed, dysentery, regurgitation and profound thirst[147]. The flowers are used in the treatment of scrofula[218]. The stem bark is used to treat poisoned wounds whilst the stem sap is used to treat lacquer poisoning[218].

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer

has a long history of medicinal use, being employed traditionally in the treatment of diseases related to a compromised immune system. The plant has an interesting chemistry and it is currently (1995) being investigated as a potential anti-AIDS drug[238]. It contains potent anti-inflammatory agents, antiviral proteins and substances that affect cell division[238]. These compounds are toxic to many disease-causing organisms, including the water snails that cause schistosomiasis[238]. All parts of the plant are toxic, an excess causing diarrhoea and vomiting[238]. This remedy should be used with caution and preferably under the supervision of a qualified practitioner. It should not be prescribed for pregnant women[238]. The root is alterative, anodyne, anti-inflammatory, cathartic, expectorant, hypnotic, narcotic and purgative[4, 21, 46, 61, 165, 192, 238]. The dried root is used as an anodyne and anti-inflammatory[213]. The root is taken internally in the treatment of auto-immune diseases (especially rheumatoid arthritis), tonsillitis, mumps, glandular fever and other complaints involving swollen glands, chronic catarrh, bronchitis etc[238]. The fresh root is used as a poultice on bruises, rheumatic pains etc, whilst a wash made from the roots is applied to swellings and sprains[222]. The root is best harvested in the autumn and can be dried for later use[238]. The fruit has a similar but milder action to the roots[238].The juice is used in the treatment of cancer, haemorrhoids and tremors[213]. A poultice made from the fruit is applied to sore breasts[222]. A tea made from the fruit is used in the treatment of rheumatism, dysentery etc[222]. The plant has an unusually high potassium content and the ashes, which contain over 45% caustic potash, have been used as a salve for ulcers and cancerous growths[232]. The leaves are cathartic, emetic and expectorant[222]. A homeopathic remedy is made from the fresh root[232]. Its main action is on the throat, breast, muscular tissues and the joints[232].

propta Seed - sow autumn or spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it might be worthwhile trying an outdoor sowing in a seed bed in early spring. Grow the plants on in the seedbed for their first year and plant them out the following spring. Division in March or October. Use a sharp spade or knife to divide the rootstock, making sure that each section has at least one growth bud. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta An easily grown plant, succeeding in most soils[1], though preferring a moisture retentive soil in full sun or partial shade[111, 200]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Succeeds in an open woodland garden[200], growing well under trees[20]. Whilst the dormant plant is hardy in much of Britain, the young growth in spring can be damaged by late frosts. A very ornamental plant[1], it often self sows when in a suitable position[200]. Cultivated as a dye plant[50] and on a small scale for its edible young shoots, there is at least one named form. 'White Stem' has white stems and the berries yield a golden-peach dye instead of purple. It is not yet known (1992) if it will breed true from seed[183]. This plant is an alternative host to a number of viral diseases that affect members of the Amaryllidaceae, Liliaceae (broad view, including plants recently [1992] moved into separate families) and Solanaceae[200]. Plants seem to be immune to the predations of rabbits[233]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zones. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a

clumper with limited spread [1-2].

### 5.2.243 Viburnum edule

Mooseberry, Squashberry

4 tin 8 cyuc 3 kcaak 3 tcan 1 dwat 2.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfri hpa7tli flatprikwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum edule is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers FruitEdible Uses: Fruit - raw or cooked[11, 62, 101, 257]. The fully ripe fruits are mildly acid with a pleasant taste[183]. The ovoid fruit is about 8mm long and contains a single large seed[200]. The fruit can also be dried for winter use[183]. It is highly valued for jam[43]. It is best before a frost and with the skin removed[85, 172]. Another report says that the native Americans would often not harvest the fruit until it had been frosted[257]. Some caution is advised, see the notes above on toxicity. Flowers - used in fritters[172].

tcanta BasketryThe stems have been used to reinforce birch bark basket rims[257].

dwatta Antispasmodic Astringent Dysentery Odontalgic SalveThe bark is antispasmodic and astringent[172, 257]. An infusion of the crushed inner bark has been used in the treatment of dysentery and has also been used as a purgative[257]. The bark has been chewed and the juice swallowed in the treatment of whooping cough and 'cold on the lungs'[257]. A decoction of the stems has been used in the treatment of coughs[257]. An infusion of the leaves and stems has been used as a gargle in the treatment of sore throats[257]. The twig tips have been chewed and the juice swallowed in the treatment of sore throats[257]. A poultice of the chewed, unopened flower buds has been applied to lip sores[257]. A decoction of the roots has been used to treat sickness associated with teething[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Grows well in heavy clay soils. Prefers a slightly acidic soil[172]. Best if given shade from the early morning sun in spring[200]. Plants are possibly self-incompatible[11] and may need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Closely allied to *V. opulus*, but this species has no sterile flowers in the inflorescence and is a superior fruiting form[11].

of rabbits[233]. Often cultivated as a dye and a medicinal plant[46, 61]. Very closely related to *P. conspicuum*[58]. Dioecious, male and female plants must be grown if seed is required[58]. Special Features:Attractive foliage, Invasive, Wetlands plant.

## 5.2.240 Reynoutria japonica

Japanese knotweed.  
4 tlin 8 cyuc 3 kcaak 3 tcan 3 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Reynoutria japonica* is a PERENNIAL growing to 2 m (6ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Seed Shoots StemEdible

Uses: Edible Portion: Leaves, Shoots, Rhizomes, Roots. Young shoots in spring - cooked. They can be used as an asparagus substitute[55, 62, 116, 1599, 179, 183]. They have an acid flavour and can also be used as a rhubarb substitute in pies, fruit soups, jams etc[183]. Older stems and shoot tips - cooked[62, 159]. They taste like a mild version of rhubarb[K]. Seed - raw or cooked. It is rather small and fiddly to utilize. The seed can also be ground into a powder and used as a flavouring and thickener in soups etc, or can be mixed with cereals when making bread, cakes etc. The root is sometimes eaten[183].

tcanta Carbon Farming Solutions - Industrial Crop: fiber (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1].

dwatta Possibly may have similar properties to other knotweeds where the root can be antiphlogistic, bechic, depurative, diuretic, emmenagogue, emollient, febrifuge, stomachic and vulnerary[46, 61, 147, 178, 218]. It is also used in the treatment of women's complaints[147]. A decoction is used in the treatment of burn injuries, boils and abscesses, poisonous snakebites, acute hepatitis, appendicitis, traumatic injuries and menstrual irregularities[147]. The leaves can be crushed and applied externally as a poultice to abscesses, cuts etc, whilst the dried roots can be ground into a powder and applied externally[147]. Extracts of the plant have shown antitumour activity[218].

propta Plants can be grown from seeds.

nwatta Experimental Crop Industrial Crop: Fiber Management: HayClimate: cold to warm temperate. Humidity: humid. Carbon Farming Solutions - Cultivation: experimental. Management: hay (Describes the non-destructive management systems that are used in cultivation) [1-1]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 5.2.241 Scirpus lacustris

Bulrush  
4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 2.5 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Scirpus lacustris* is a PERENNIAL growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves Pollen Root Seed StemEdible Uses: Root - raw or cooked[2, 85, 95, 183]. Rich in starch, it can be dried and ground into a powder or made into a

syrup[13, 85, 95, 183]. The buds at the end of the rhizomes are crisp and sweet, making excellent eating raw[183]. Young shoots - raw or cooked[85, 183]. Used in spring. Seed - ground up into a powder and mixed with flour for use in making cakes etc[85, 183]. The seed is small and rather fiddly to harvest and utilize. Base of mature stems - raw or cooked. Somewhat tough[85]. Pollen - raw or cooked. Rich in pollen, it is mixed with flour and used in making cakes etc[85, 183].

tcanta Paper Thatching WeavingThe stems are frequently used for making matting, chair bottoms etc and thatching[1, 4, 23, 85, 100, 115]. They were at one time imported in large quantities for this purpose[4]. The pith of the stems is used in paper making[100].

dwatta Astringent Cancer DiureticThe roots are astringent and diuretic[240]. They were formerly employed medicinally but have fallen into disuse[4]. This plant is a traditional medicine for cancer[218].

propta Seed - sow in a cold frame as soon as it is ripe in a pot standing in 3cm of water. Only just cover the seed with soil[200]. The seed usually germinates fairly quickly. Prick out the plants when large enough to handle and plant out in their permanent positions in early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any wet to moisture retentive soil, pond margins and shallow water in full sun or shade[1, 200]. Plants can succeed in fairly deep water. Hardy to about -25°C[187]. Some named forms have been selected for their ornamental value[187].

## 5.2.242 Phytolacca americana

Pokeweed, American pokeweed, Garnet, Pigeon Berry, Poke  
4 tlin 8 cyuc 3 kcaak 2 tcan 3 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Phytolacca americana* is a PERENNIAL growing to 2 m (6ft) by 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Colouring/Leaves - they must be cooked and even then it is best to change the water once[1, 2, 4, 33, 95]. They are used like spinach[183]. Only the young leaves should be used since they become toxic with age[102]. Caution is advised, see the notes above on toxicity. Young shoots - cooked[20, 33, 62, 102]. An asparagus substitute[183], they are delicious[159]. The shoots are sometimes blanched before using, or forced in cellars to provide an early crop[183]. The tender clear inner portion of the stem can be rolled in cornmeal and fried[183]. Although cultivated on a small scale in N. America for its shoots, caution is advised, see notes above. A nutritional analysis is available[218]. Fruit - cooked and used in pies[159, 213]. Poisonous raw, causing vomiting and diarrhoea. Even the cooked fruits should be viewed with caution. The fruit is a berry about 12mm in diameter[200]. A red dye is obtained from the fruit and used as a food colouring[183].

tcanta Ink Insecticide SoapA red ink and a dye are obtained from the fruit[46, 50, 57, 100, 102, 159, 169]. A beautiful colour, though it is not very permanent[4]. It makes a good body paint, washing off easily when no longer required, though the slightly toxic nature of the berries should be remembered[K]. The rootstock is rich in saponins and can be used as a soap substitute[169]. Cut the root into small pieces and simmer it in boiling water to obtain the soap. The plant is currently (1980) being evaluated for its snail-killing properties[213].

dwatta Alterative Anodyne Antiinflammatory Antirheumatic Antiviral Cancer Cathartic Dysentery Expectorant Homeopathy Hypnotic Narcotic PurgativePokeweed

or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Industrial Crop: Biomass Industrial Crop: Tannin Management: Standard Minor Global Crop Other Systems: Strip intercrop Staple Crop: Balanced carbPrefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Although very winter-hardy, this species does not do well in Britain, it only really thrives in areas with hot summers[200]. Does not fruit well in Britain[11, 200]. A tree in semi-shade at Kew in 1990 was 9 metres tall[K]. Extensively cultivated for its edible seed in China, and also much grown in America, there are a number of named varieties[117, 183, 200, 266]. Plants can fruit in 5 - 7 years from seed[117] and yields from mature trees are around 25 - 60 kilos per tree[160]. Resistant, but not immune, to blight[183], it is hybridized with *C. dentata* to try and find blight resistant cultivars with superior seeds[200]. A shallow rooted tree[160]. Responds well to coppicing[11, 109]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Blooms are very showy. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 5.2.181 Pyrus pashia

Indian Wild Pear  
4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 9 m hkuc  
hmimhtut cyutli hqattcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Pyrus pashia* is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 11, 51, 105, 158, 272]. Up to 2.5cm in diameter[194]. The fruit is usually bletted[183], but even then it is not sweet[146]. Tasty when fully ripe, even when dried[194]. Our experience is that the fully ripe fruit has a reasonable flavour and, when bletted, is sweet and very pleasant[K]. A mature tree yields about 45kg of fruit per year[194]. The fruit contains about 6.8% sugars, 3.7% protein, 1% ash, 0.4% pectin. Vitamin C is very low, about 1.2mg per 100g[194].

tcanta Rootstock WoodThis plant can be used as a rootstock for the cultivated pear[194]. Wood - compact fine grained, hard, durable, liable to split and warp during seasoning. Used for small implements, walking sticks and fuel[51, 158, 266].

dwatta AstringentThe juice of the ripe fruit is used in the treatment of diarrhoea[272].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary

dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200].

## 5.2.182 Taxus x media

Anglojapanese Yew  
4 tlin 7 cyuc 3 kcaak 4 tcan 4 dwat m hkuc  
pcimhmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflatprikliwissip hpa7tmwatli nyanhjen hjonli

drutta *Taxus x media* is an evergreen Shrub growing to 6 m (19ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[K]. Very sweet and gelatinous, most people find it delicious though some find it sickly[K]. The fruit is a fleshy berry about 10mm in diameter and containing a single seed[200]. All other parts of this plant, including the seed, are highly poisonous. When eating the fruit you should spit out the large seed found in the fruit's centre. Should you swallow the whole seed it will just pass straight through you without harm, if the seed has been bitten into, however, it could cause some problems.

tcanta WoodWood - strong, hard, heavy. Used for paddles, fence posts etc.

dwatta Modern research has shown that yew trees contain the substance 'taxol' in their shoots and bark. Taxol has shown exciting potential as an anti-cancer drug, particularly in the treatment of ovarian cancers[222, 238]. This remedy is very toxic and, even when used externally, should only be used under the supervision of a qualified practitioner[238]. See also the notes above on toxicity.

propta Seed - can be very slow to germinate, often taking 2 or more years[78, 80]. It is best sown as soon as it is ripe in the autumn when it should germinate 18 months later. Stored seed may take 2 years or more to germinate. 4 months warm followed by 4 months cold stratification may help reduce the germination time[113]. Harvesting the seed 'green' (when fully developed but before it has dried on the plant) and then sowing it immediately has not been found to reduce the germination time because the inhibiting factors develop too early[80]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in pots in a cold frame. The seedlings are very slow-growing and will probably require at least 2 years of pot cultivation before being large enough to plant out. Any planting out is best done in late spring or early summer, after the last expected frosts[K]. This is a hybrid species, it will not breed true from seed. Cuttings of half-ripe terminal shoots, 5 - 8cm long, July/August in a shaded frame. Should root by late September but leave them in the frame over winter and plant out in late spring[78]. High percentage[11]. Cuttings of ripe terminal shoots, taken in winter after a hard frost, in a shaded frame[113].

nwatta Landscape Uses:Border, Hedge, Massing, Screen, Superior hedge. Thrives in almost any soil, acid or alkaline, as long as it is well-drained[200]. Succeeds in dry soils. Plants are very shade tolerant[82]. Dormant plants are very cold-hardy in Britain, though the new growth in spring can be damaged by light frosts[K]. Leaves have a reddish

tinge when the plants are grown in a sunny position[200]. Plants produce very little fibrous root and should be planted in their final positions when still small[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. The cultivar 'Sargenti' was 3 metres tall and 1 metre wide at the Hillier Arboretum in September 1993. It was growing well and carrying a good crop of tasty fruit though the harvest time seemed to be somewhat later than that of *T. baccata*[K]. Special Features: Not North American native, Inconspicuous flowers or blooms.

## 5.2.183 *Carya glabra megacarpa*

Coastal Pignut Hickory

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta *Carya glabra megacarpa* is a deciduous Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105]. A sweet flavour. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel WoodNone known dwatta None known

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

## 5.2.184 *Claytonia megarhiza*

Alpine Spring Beauty

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flat hpa7tmwatli xre7t hjonli

drutta *Claytonia megarhiza* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year,

in flower from April to July, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Root - raw or cooked[2, 62, 85, 161]. Peeled, then boiled or baked[183]. The root is long, fleshy and up to 2.5cm thick[183, 200]. Leaves and flowering tops - raw or cooked as a potherb[85, 172, 183]. Succulent, juicy and mild in flavour[183]. Flowers - raw.

tcanta None known dwatta None known

propta Seed - surface sow on a peat based compost in spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 10°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Division of offsets in spring or autumn.

nwatta Prefers a damp peaty soil and a position in full sun[1, 164]. Requires a very well-drained lime-free soil[164, 200]. A very cold hardy plant, succeeding outdoors in all parts of Britain, but it is liable to rot if the soil is wet[60, 200]. A good plant for the rock garden[60]. Plants are prone to aphid infestation[188]. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.185 *Juglans mandschurica*

Manchurian Walnut

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta *Juglans mandschurica* is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil Oil SeedEdible Uses: Oil OilSeed - raw or roasted[183]. The kernels are well filled but difficult to extract because the shell is thick[74, 117, 183]. An edible oil is obtained from the seed[105, 183], it tends to go rancid quickly.

tcanta Herbicide Miscellany Oil Oil Rootstock String WoodThe seed contains up to 52% oil and, as well as being edible, it has industrial uses[74]. A rope is made from the bark of young trees[74]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dissolved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp).[200]. The inner bark is used to make heel pieces for straw shoes[151]. Sometimes used as a rootstock to confer greater cold resistance[183]. Wood - hard, durable. Used for veneer, furniture etc[46, 61, 74].

## 5.2.238 *Chaenomeles speciosa*

Japanese Quince, Flowering quince

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 3 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Chaenomeles speciosa* is a deciduous Shrub growing to 3 m (9ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from February to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - cooked[3, 4, 177]. Very harsh and acid raw but fragrant when cooked[1, 11]. Used for jams, jellies etc and as a flavouring with cooked apples[183, K]. The fruit can be apple or pear-shaped and up to 6.5cm long x 6.5cm wide[200].

tcanta Hedge HedgePlants can be grown as a medium sized hedge[11, 29, 200]. Some cultivars, such as 'Jet Trail' are suitable for ground cover[182].

dwatta Analgesic Antiemetic Antiinflammatory Antispasmodic Astringent Cholera DigestiveThe fruit is analgesic, anti-inflammatory, antispasmodic, astringent and digestive[147, 218, 238]. A decoction is used internally in the treatment of nausea, joint pains, cholera and associated cramps[147, 218, 238].

propta Seed - best sown as soon as it is ripe in a sheltered position outdoors or in a cold frame[200]. Sow stored seed in February in a greenhouse[78]. Germination usually takes place within 6 weeks[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle. If well grown, these seedling can be large enough to plant out in the summer, but give them some protection in their first winter. Otherwise plant them out in late spring of the following year[K]. Cuttings of half-ripe wood, July/August in a frame[11]. Easy[113]. Cuttings of mature wood of the current year's growth, November in a cold frame. Layering in late spring or in autumn. This is a sure and easy method, though it takes 12 months[78, 200].

nwatta Landscape Uses:Border; Espalier; Hedge, Massing, Woodland garden . Easily cultivated in any reasonably good soil[1, 11]. Prefers a deep moist well-drained loam[11]. Grows well in heavy clay soils. Tolerates full shade but requires a sunny position for best fruit production[3, 11, 200]. Becomes chlorotic on very alkaline soils[200]. Tolerates atmospheric pollution[200]. This species is hardy to about -25°C[200]. Plants fruit freely in Britain, but the fruit does not always ripen. They do best when grown against a south-facing wall[11]. A very ornamental plant[1], there are many named varieties developed for their ornamental value[182, 183]. Closely allied to *C. japonica*[11]. A good bee plant, flowering early in the year and providing pollen and nectar[108]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.239 *Polygonum japonicum*

Japanese Knotweed, Mexican Bamboo, Japanese Knotweed

4 tin 10 cyuc 3 kcaak 0 tcan 3 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta *Polygonum japonicum* is a PERENNIAL growing to 3 m (9ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) . . The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Seed StemEdible Uses: Young shoots in spring - cooked. They can be used as an asparagus substitute[55, 62, 116, 1599, 179, 183]. They have an acid flavour and can also be used as a rhubarb substitute in pies, fruit soups, jams etc[183]. Older stems and shoot tips - cooked[62, 159]. They taste like a mild version of rhubarb[K]. Seed - raw or cooked. It is rather small and fiddly to utilize. The seed can also be ground into a powder and used as a flavouring and thickener in soups etc, or can be mixed with cereals when making bread, cakes etc. The root is sometimes eaten[183].

tcanta Biomass DyeA yellow dye is obtained from the root[46, 61]. The plant is potentially a good source of biomass. Plants can be grown to form a ground cover that will exclude all other growth[208]. It is best to use the sub-species compactum since this is less invasive[208].

dwatta Antiphlogistic Antitumor Depurative Diuretic Emollient Febriifuge Stomachic Vulnerary Women's complaintsThe root is antiphlogistic, bechic, depurative, diuretic, emmenagogue, emollient, febriifuge, stomachic and vulnerary[46, 61, 147, 178, 218]. It is also used in the treatment of women's complaints[147]. A decoction is used in the treatment of burn injuries, boils and abscesses, poisonous snakebites, acute hepatitis, appendicitis, traumatic injuries and menstrual irregularities[147]. The leaves can be crushed and applied externally as a poultice to abscesses, cuts etc, whilst the dried roots can be ground into a powder and applied externally[147]. Extracts of the plant have shown anti-tumour activity[147].

propta Seed - sow spring in a cold frame. Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Container, Specimen, Woodland garden. A very easily grown plant, it succeeds in ordinary garden soil in sun or shade[1, 111], though it prefers a moist soil in partial shade[187]. Japanese knotweed is an extremely invasive plant capable of sending up new shoots at a considerable distance from the main clump and also of growing up through tarmac[200]. The sub-species cuspidatum is the form that is most likely to cause problems. It is considered to be a pest in many areas, where it is forming large clumps in the wild and out-competing native species. If grown in the garden it should be planted within a strong barrier to contain its roots. The sub-species compacta is only about 70cm tall and is far less invasive, but should still not be grown in small gardens[200]. A report on the Natural History Programme stated that Japanese knotweed is actually becoming a very valuable habitat for spiders, frogs, grass snakes and many other creatures. Its hollow stems allow a wide variety of insects and other small creatures to overwinter and find hiding places, thus a greater abundance of food is provided for insectivores such as frogs, who are themselves eaten by grass snakes. In areas of north Wales where Japanese knotweed has run rife, it is now the primary habitat for grass snakes[215]. Plants seem to be immune to the predations



kcakta Edible Parts: Flowers FruitEdible Uses: Fruit - raw or cooked[13]. The tastiest fruit in this genus[7]. Rich in vitamin C, the seed can be removed and the fruit used in jellies, preserves etc[183]. The fruit is about 5mm in diameter and is borne in large clusters, making it easy to harvest[200]. Some caution is advised, see notes above on toxicity. Flowers - raw or cooked.

tcanta Repellent Straw WoodThe leaves are used to repel insects[6]. Wood - commonly used in the manufacture of domestic items. It can be hollowed out to make flutes, pipes, straws etc[7, 99].

dwatta Anodyne Carminative Depurative Diaphoretic Diuretic Laxative Purgative Resolvent Vitamin C Vulnerary-The leaves, stems and the roots are anodyne, carminative and vulnerary[13, 147]. A decoction is used in the treatment traumatic injuries, fractures, rheumatoid arthralgia, gas pains, acute and chronic nephritis[147]. The fruit is depurative and laxative[7, 9]. The leaves are diuretic, resolvent and sudorific[7]. They are used externally to soothe abscesses and boils[7]. The root, and the oil from the seed, are purgative[7, 9].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78]. Division of suckers in the dormant season.

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position. Prefers cool moist conditions. Tolerates atmospheric pollution and coastal situations. Hardy to about -25°C[184]. Plants self-sow in N. Britain but they rarely fruit well in S. Britain[3, 182]. There are some named varieties developed for their ornamental value[182]. The flowers have a sweet smell, free from the fishy undertones found in some other members of the genus[245]. This subspecies has larger fruits and seeds than the type[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.236 Amelanchier sanguinea

Roundleaf Serviceberry, Gaspé serviceberry  
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc  
hmmihmtt cyutli kyucctcup hwicli hrasjlutnykfrp hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier sanguinea is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[101, 105]. A sweet flavour[177]. The fruit is produced in small clusters and is up to 11mm in diameter[229]. The fruit is rich in iron and copper[226].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the

seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200], but thrives in any soil that is not water-logged[11]. Grows well in heavy clay soils. Tolerates dry soils[200]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Plants produce suckers and form thickets[200]. Hybridizes with *A. stolonifera*, *A. laevis* and *A. bartramiana*. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 5.2.237 Vaccinium stamineum

Deerberry

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc  
hmmihmtt cyutli kyucctcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium stamineum is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acidic soils and can grow in very acidic soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Unpalatable[200]. The quality varies from shrub to shrub[183]. When cooked and served cold they are considered to be delicious with a flavour suggesting gooseberry and cranberry sauce with the slightly bitter aftertaste of grapefruit marmalade[183]. The fruit is about 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Another report says that it prefers a position in partial shade[184]. Requires shelter from strong winds[200]. Plants are hardy to about -25°C[184]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. A polymorphic species, the plants are very variable in leaf shape. It is closely related to *V. neglectum*[11]. Plants in this genus are notably resistant to honey fungus[200].

dwatta Cancer MiscellanyThe cotyledons are said to be a cure for cancer[218].

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such as the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. A very hardy and ornamental tree[1], it is recommended for cultivation in severe cold climates[183]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. Closely allied to *J. cathayensis*[11].

## 5.2.186 Heracleum sphondylium montanum

Cow Parsnip

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat m hkuc  
pcimhmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Heracleum sphondylium montanum is a PERENNIAL growing to 2.4 m (7ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root StemEdible Uses: Condiment SaltRoot - cooked[2, 46, 85, 94]. Tastes like a swede[155, 183]. Used like potatoes, though it is considered to be poisonous by some writers[213]. The peeled stem can be eaten raw but is best cooked[2, 61, 183]. The unpeeled stem can be used when young, or just the inner tissue of older stems can be used, before the plants flower[85, 94]. For people not used to the flavour, they are best cooked in two changes of water when they make a tasty celery-like vegetable[213]. Another report says that, despite the strong odour of the leaves and outer skin, the peeled young stems are mild and sweet, resembling celery in flavour[256]. The stems cannot be eaten raw in large quantities because they give a burning sensation in the mouth[257]. The stems are highly nutritious, containing up to 18% protein[213]. Leaves and young shoots - raw or cooked[55, 85, 94, 118]. Cooked as greens or added to salads[183]. Young flowers[46, 61, 105]. No further details. The dried seeds are used as a flavouring for soups, stews and potato salads[85, 183]. The dried base of the plant and ashes from the burnt leaves are used as a salt substitute[183].

tcanta Dye Musical Packing Repellent StrawWhistles, flutes, straws etc can be made from the hollow stems[99, 257]. The leaves are used as a covering for baskets of fruit

etc[99]. A yellow dye is obtained from the roots[257]. An infusion of the blossoms, rubbed on the body, repels flies and mosquitoes[257].

dwatta Antidandruff Antirheumatic Antispasmodic Carminative Epilepsy Febrifuge Odontalgic Stimulant TB TonicCow parsnip was widely employed medicinally by a large number of native North American Indian tribes who used it to treat a wide variety of complaints, but especially as a poultice on bruises, sores etc[257]. It is little used in modern herbalism, though perhaps it merits further investigation. All parts of the plant are antirheumatic, antispasmodic, carminative, febrifuge, odontalgic and stimulant[21, 94, 155, 172, 257]. The leaves are tonic[257]. They have been used in the treatment of colds[257]. A soothing drink made from the leaves is used to treat sore throats[257]. A poultice of the heated leaves has been applied to minor cuts, sore muscles etc[257]. An infusion of the fresh young stems has been used in the treatment of diarrhoea[257]. It has also been used as a wash to remove warts[257]. The plant has been used in the treatment of epilepsy[213]. A tea made from the roots is used in the treatment of indigestion, colds, stomach cramps, rheumatism, sore throats, TB etc[222, 257]. Externally, the root is used as a poultice on sores, bruises, swellings, boils, rheumatic joints, VD scabs etc, whilst a bit of root has been held on an aching tooth to reduce the pain[222, 257]. The root can be crushed, mixed with water and used as an antidandruff hair wash[257]. The root contains psoralen, which is being investigated for its use in the treatment of psoriasis, leukaemia and AIDS[222]. The seed has been used to treat severe headaches[257].

propta Seed - sow mid to late spring or early autumn in situ. Division in autumn.

nwatta Succeeds in any ordinary garden soil, doing best in moist soils or deep woodland[1, 55, 60].

## 5.2.187 Arctium minus

Lesser Burdock

4 tin 8 cyuc 3 kcaak 4 tcan 5 dwat m hkuc  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Arctium minus is a BIENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Seed StemEdible Uses: CoffeeRoot - raw or cooked[62, 85]. The best roots are obtained from young plants[85]. Usually peeled and sliced[183]. The roasted root is a coffee substitute[183]. Young leaves and leaf stems - raw or cooked[85]. Used as a potherb[183]. Mucilaginous. It is best to remove the rind from the stem[85]. Young flowering stem - peeled and eaten raw or cooked like asparagus[177, 183]. Seed sprouts[55]. No further details.

tcanta PaperA fibre is obtained from the inner bark and is used to make paper. It is about 0.9mm long[189]. The stems are harvested in late summer, the leaves are removed and the stems steamed in order to strip off the fibre. The fibres are then cooked for two hours in soda ash before being put in a ball mill for 2 hours[189]. The resulting paper is a light tan/ brown colour[189].

dwatta Alterative Antibacterial Antifungal Aperient Blood purifier Carminative Chologogue Diaphoretic Diuretic Eczema Hypoglycaemic Burdock is one of the foremost detoxifying herbs in both Chinese and Western herbal medicine[254]. *Arctium lappa* is the main species used, though this species has similar properties[254]. The dried root of one year old plants is the official herb, but the leaves and fruits can also be used[4]. It is used to treat conditions caused by an 'overload' of toxins, such as throat and other infections, boils, rashes and other skin problems[254]. The root is thought to be particularly good at helping to eliminate heavy metals from the body[254]. The plant is antibac-

terial, antifungal and carminative[9, 21, 147, 165, 176]. It has soothing, mucilaginous properties and is said to be one of the most certain cures for many types of skin diseases, burns, bruises etc[4, 244]. It is used in the treatment of herpes, eczema, acne, impetigo, ringworm, boils, bites etc[244]. The plant can be taken internally as an infusion, or used externally as a wash[244]. Use with caution[165]. One-year old roots are alterative, aperient, blood purifier, cholagogue, depurative, diaphoretic, diuretic and stomachic[218, 222]. The seed is alterative, antibacterial, antifungal, antiplogistic, depurative, diaphoretic, diuretic and hypoglycaemic[176, 218]. It is used in the treatment of colds with sore throat and cough, measles, pharyngitis, acute tonsillitis and abscesses[176]. The crushed seed is poulticed onto bruises[222]. The seed is harvested in the summer and dried for later use[254]. The seed contains arctiin, this excites the central nervous system producing convulsions an increase in respiration and later paralysis. It also lowers the blood pressure by dilating the blood vessels[176]. The leaves are poulticed onto burns, ulcers and sores[222].

propta Seed - best sown in situ in autumn.

nwatta Succeeds on most soils, preferably moist[200]. Prefers a sunny position. Prefers partial shade according to another report[200]. A polymorphic species[17]. A good butterfly plant[24]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.188 Achillea millefolium

Yarrow, Boreal yarrow, California yarrow, Giant yarrow, Coast yarrow, Western yarrow, Pacific yarrow  
4 tin 8 cyuc 3 kcaak 4 tcan 4 dwat m hkuc  
hmimhtut cyutli hqatkyuctup hwicli hyshrasj]lutnyik hpa7tli flatprikwslip hpa7tmwatli xre7t hjonli

drutta Achillea millefolium is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked[4, 5, 46, 52]. A rather bitter flavour, they make an acceptable addition to mixed salads and are best used when young[9, 183, K]. The leaves are also used as a hop-substitute for flavouring and as a preservative for beer etc[2, 9, 53, 183]. Although in general yarrow is a very nutritious and beneficial plant to add to the diet, some caution should be exercised[K]. See the notes above on possible toxicity. An aromatic tea is made from the flowers and leaves[183]. An essential oil from the flowering heads is used as a flavouring for soft drinks[183].

tcanta Companion Compost Cosmetic Dye Essential Hair Liquid feed RepellentThe growing plant repels beetles, ants and flies[14, 99, 172]. The plant has been burnt in order to ward off mosquitoes[257]. A liquid plant feed can be made from the leaves[54]. You fill a container with the leaves and then add some water. Leave it to soak for a week or two and then dilute the rather smelly dark liquid, perhaps 10 - 1 with water though this figure is not crucial[K]. This plant is an essential ingredient of 'Quick Return' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The fragrant seeds have been used to impart a pleasant smell indoors[257]. An essential oil obtained from the leaves is used medicinally[17, 46, 61]. The leaves contain from 0.6 to 0.85% essential oil[240]. The leaves have been used as a cosmetic cleanser for greasy skin[268]. Yellow and green dyes are obtained from the flowers[168]. A good ground cover plant, spreading quickly by

its roots[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. Nectary, invertebrate shelter.

dwatta Antidiarrhoeal Antiinflammatory Antiseptic Antispasmodic Appetizer Aromatic Astringent Carminative Cholagogue Diaphoretic Digestive Emmenagogue Odontalgic Stimulant Tonic Vasodilator VulneraryYarrow has a high reputation and is widely employed in herbal medicine, administered both internally and externally. It is used in the treatment of a very wide range of disorders but is particularly valuable for treating wounds, stopping the flow of blood, treating colds, fevers, kidney diseases, menstrual pain etc[218, 238, 254, 257]. The whole plant is used, both fresh and dried, and is best harvested when in flower[222]. Some caution should be exercised in the use of this herb since large or frequent doses taken over a long period may be potentially harmful[222], causing allergic rashes and making the skin more sensitive to sunlight[238]. The herb combines well with Sambucus nigra flowers (Elder) and Mentha x piperita vulgaris (Peppermint) for treating colds and influenza[268]. The herb is antiseptic, antispasmodic, mildly aromatic, astringent, carminative, cholagogue, diaphoretic, digestive, emmenagogue, odontalgic, stimulant, bitter tonic, vasodilator and vulnerary[4, 9, 14, 21, 54, 145, 165, 172, 238, 240, 254]. It also contains the anti-inflammatory agent azulene, though the content of this varies even between plants in the same habitat[238]. The herb is harvested in the summer when in flower and can be dried for later use[4]. The fresh leaf can be applied direct to an aching tooth in order to relieve the pain[268].

propta Seed - sow spring or early autumn in a cold frame[133]. The seed usually germinates in 1 - 3 months[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Very easy, the divisions can be planted direct into their permanent positions. Divisions succeed at any time of the year. Basal cuttings of new shoots in spring. Very easy, collect the shoots when they are about 10cm tall, potting them up individually in pots and keeping them in a warm but lightly shaded position. They should root within 3 weeks and will be ready to plant out in the summer.

nwatta Landscape Uses:Container, Ground cover, Massing, Seashore, Woodland garden. Succeeds in most soils and situations but prefers a well-drained soil in a sunny position[1, 14]. Shade tolerant[13]. Plants live longer when grown in a poor soil[200] and also do well on lime[208]. Established plants are very drought tolerant[200], they can show distress in very severe droughts but usually recover[190]. It remains green after grass has turned brown in a drought[187]. Plants succeed in maritime gardens[233]. The plant has a very spreading root system and is usually quite invasive[233, K]. A very hardy plant, tolerating temperatures down to about -25°C[187]. Yarrow is an excellent plant for growing in lawns, meadows, orchards etc., it is tolerant of repeated close cutting and of being walked on[20, 54]. It works to improve the soil fertility[20, 54]. A very good companion plant, it improves the health of plants growing nearby and enhances their essential oil content thus making them more resistant to insect predations[14, 18, 20, 53]. There are some named forms, selected for their ornamental value[183, 238]. 'Pink' (syn. 'Rosea') has very aromatic foliage and deep pink flowers[183]. Hybridizes freely with other members of this genus[200]. A good bee plant, it is an important nectar source for many insects[24]. Special Features: Attractive foliage, Edible, Fragrant foliage, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a

drutta Eleutherococcus sieboldianus is a deciduous Shrub growing to 3 m (9ft) by 2.5 m (8ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

ckakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - cooked[46, 61, 177]. A delicious somewhat fragrant flavour[105, 183]. The dried leaves are a tea substitute[183]. tcanta Hedge HedgeThe plant is used as a hedge[200]. dwatta None known propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season's growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Landscape Uses:Border, Hedge, Massing, Screen, Specimen. Prefers a light warm open loamy humus-rich soil and a position sheltered from north and east winds[11, 200]. Prefers a well-drained soil and full sun[200]. Thrives in sun or shade according to another report. Tolerates urban pollution and poor soils[200]. Plants are hardy to at least -15°C if they are sheltered from cold winds[200]. Cultivated as a medicinal and culinary plant in Japan[58], there are some named varieties selected for their ornamental value[200]. Special Features:Attractive foliage, Not North American native.

## 5.2.233 Vaccinium fuscatum

Black Highbush Blueberry  
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3.5 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasj]lut hpa7tli frusflat hpa7tmwatli dyatxre7t hjonli

drutta Vaccinium fuscatum is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 105, 200]. Large, sweet, juicy and very flavourful[183]. The fruit is about 8mm in diameter[200].

tcanta None known dwatta None known propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist or wet lime free soil[11, 184, 200], preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6. plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Plants are hardy to about

-25°C[184]. This species is often cultivated for its edible fruit[3]. Plants are self-sterile, at least two different varieties must be grown if seed is required[11]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Closely related to *V. corymbosum*[11, 182]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.234 Helianthus giganteus

Giant Sunflower  
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasj]lutnyik hpa7tli flatprikwliw hpa7tmwatli xre7t hjonli

drutta Helianthus giganteus is a PERENNIAL growing to 3.6 m (11ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: Root SeedEdible Uses: Tubers - cooked[95]. A similar taste to Jerusalem artichokes but less productive. The var. 'subtuberosus' is used[1, 177]. Seed - raw or cooked. It can be dried and ground into a powder, then mixed with cornmeal and used for making bread[2, 14, 46, 61, 183]. The seed is very small and fiddly to use[K].

tcanta None known dwatta None known propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. Likes moist soils, doing well by a stream[200]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants have a running root system and can be invasive[1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.235 Sambucus racemosa kamschica

Red Elder  
4 tin 8 cyuc 3 kcaak 2 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasj]lutnyikfrip hpa7tli flatprikwliw hpa7tmwatli xre7t hjonli

drutta Sambucus racemosa kamschatica is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

sloe is very resistant to maritime exposure and also suckers freely. It can be used as a hedge in exposed maritime positions. The hedge is stock-proof if it is well maintained[1, 29], though it is rather bare in the winter and, unless the hedge is rather wide, it is not a very good shelter at this time[K]. Because of its suckering habit, the plant is a natural pioneer species, invading cultivated fields and creating conditions conducive to the regeneration of woodland. Wood - very hard. Used for turnery, the teeth of rakes etc[1, 13, 46, 66]. Suitable branches are used for making walking sticks and are highly valued for this purpose because of their twisted and interesting shapes[7].

dwatta Antidiarrhoeal Antiflatulent Antispasmodic Aperient Astringent Depurative Diaphoretic Diuretic Febrifuge Laxative StomachicThe flowers, bark, leaves and fruits are aperient, astringent, depurative, diaphoretic, diuretic, febrifuge, laxative and stomachic[7, 9, 21]. An infusion of the flowers is used in the treatment of diarrhoea (especially for children), bladder and kidney disorders, stomach weakness et[9]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Prunus spinosa* Sloe - Blackthorn for inflammation of mouth and pharynx (see [302] for critics of commission E).

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers during the dormant season. They can be planted out direct into their permanent positions.

nwatta Agroforestry Services: Living fence Agroforestry Services: Windbreak Industrial Crop: Oil Management: Standard Regional CropLandscape Uses:Specimen. Requires a well-drained moisture retentive soil[11]. Succeeds in all soils except very acid peats[186]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. Thrives on chalk according to another report[182]. Plants are very resistant to maritime exposure[186]. An important food plant for the caterpillars of several species of butterfly[30], especially the larvae of the brown and black hairstreak butterflies[186]. A good bee plant. Plants are shallow-rooted and of a suckering habit, they can form dense impenetrable thickets which are ideal for nesting birds, especially nightingales[186]. Flowers are often damaged by late frosts[186]. Plants regenerate quickly after cutting or after fast moving forest fires, producing suckers from below ground level[186]. This species is notably resistant to honey fungus[88, 200]. Special Features: All or parts of this plant are poisonous. Blooms are very showy. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface. The root pattern is suckering with new plants from runners away from the plant [2-1].

### 5.2.231 *Corylus cornuta*

Beaked Hazel, California hazelnut, Turkish Filbert, Turkish Hazel

4 tin 7 cyuc 3 kcaak 3 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli fyif hjonli

drutta *Corylus cornuta* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to

UK zone 4. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kckaakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[2, 62, 101]. Very popular in America, the seed is sweet and well-flavoured with a thin shell[2, 85]. The seed can be dried and ground into a powder which is added to cereals and used in making bread, pies etc[85, 183]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta Basketry Dye Oil StringYoung sucker shoots are used to make a rope[99]. The shoots are soaked in urine first, to make them more pliable[257]. A blue dye is obtained from the root or inner bark[99, 101]. The branches are used in basketry[160].

dwatta Cardiac Odontalgic StomachicAn infusion of the branches and leaves has been used in the treatment of heart complaints and intestinal disorders[257]. A decoction of the bark has been given to children to alleviate teething pain[257].

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Landscape Uses:Firewood, Specimen, Street tree. An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Tolerates a pH in the range 5.8 to 7.5. Plants are fairly wind tolerant[1, 11]. Plants are hardy to about -30°C[160]. They thrive in a short growing season[160]. This species is occasionally cultivated for its edible seed in N. America[61] but is of no value in Britain as a seed bearer[11]. Plants can bear fruit in 5 - 6 years from seed[160]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. Special Features:Not North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.232 *Eleutherococcus sieboldianu*:

Ukogi, Five Leafed Aralia

4 tin 8 cyuc 3 kcaak 2 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.189 *Viola mirabilis*

wonder violet

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta *Viola mirabilis* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaakta Edible Parts: Flowers LeavesEdible Uses: TeaYoung leaves and flower buds - raw or cooked[105]. When added to soup they thicken it in much the same way as okra[85, 159]. A tea can be made from the leaves[85].

tcanta None known

dwatta CardiacCardiac[61].

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159].

### 5.2.190 *Juniperus monosperma*

One-Seed Juniper

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat m hkuc htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli nyanhjen hjonli

drutta *Juniperus monosperma* is an evergreen Tree growing to 18 m (59ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in April, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kckaakta Edible Parts: FruitEdible Uses: GumFruit - raw or cooked. Soft, juicy and pulpy[81, 85, 105], but with a thin flesh[82]. It can be dried and ground into a powder and then be baked[82, 227], or can be used as a seasoning in stews etc[161, 257]. The fruits were only used when other foods were in short supply[257]. The cones are about 5 - 8mm in diameter and ripen in their first year[200]. Inner bark - raw or cooked[257]. It was chewed in times of food shortage for the little nourishment it supplied[257]. The gum is chewed as a delicacy[161, 257]. No further details are given.

tcanta Bedding Dye Fibre Fuel Gum Lighting Mordant Tinder WoodThin strips of the fibrous bark are used for making sleeping mats etc[82, 227]. It has also been used as a lining in shoes to absorb moisture and to keep the feet warmer[257].

When rubbed fine, the bark can be used to make children's clothing[257]. The bark is employed as a tinder and is also made into a slow match or can be shredded, bound into bundles and used as a torch to give light in the house[216, 257]. The crushed bark was twisted into a rope, tied at intervals with yucca (*Yucca* species), and wrapped into a coil. The free end was set on fire and kept smouldering by blowing on it at intervals. Fire could be carried in this fashion for several hours[257]. The dried seeds have been used as beads or as the 'rattle' in rattles[216, 257]. A green dye is obtained from the bark and berries[229, 257]. A yellow dye is obtained from the whole plant[257]. Ashes from the whole plant have been used as a mordant to fix the colour of dyes[257]. Wood - moderately hard, somewhat heavy, slightly fragrant. When seasoned properly it is very durable and is used mainly for fencing and fuel[82, 227, 229]. As a fuel it burns steadily and evenly[257].

dwatta Antiphlogistic Birthing aid Diuretic Dysentery Febrifuge Laxative Odontalgic Pectoral Poultice StomachicOne-seed juniper was commonly employed medicinally by a number of native North American Indian tribes, who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. The leaves are febrifuge, laxative and pectoral[216]. An infusion is used in the treatment of stomach complaints, constipation, coughs and colds[216]. An infusion was also used by pregnant women prior to childbirth in order to relax the muscles[257]. A poultice of the heated twigs can be bound over a bruise or sprain in order to reduce the swelling[257]. An infusion of the staminate cones has been used as a stomach tonic and in the treatment of dysentery[257]. The chewed bark has been applied externally to help heal spider bites[257]. It is also highly prized as a dressing on burns[257]. The fruits are strongly diuretic[257]. A gum from the plant has been used as a temporary filling in a decayed tooth[257].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in dry soils. Succeeds in most soils, including chalk, if they are well drained[1, 11, 200], preferring a neutral or slightly alkaline soil[11]. Trees are fairly fast growing for a Juniper, and are also long-lived in their native habitats[227]. They grow better in dry areas with hot summers, western Britain is generally to cool and wet for this species to thrive[200]. Plants are resistant to honey fungus[88]. This species is closely related to *J. occidentalis*[11]. The seed matures in 1 year[200]. Some fruit is produced most years, but heavy crops only occur every 2 - 3 years[229]. Dioecious. Male and female plants must be grown if seed is required. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

### 5.2.191 *Juniperus communis*

Juniper, Common juniper

4 tin 10 cyuc 3 kcaak 4 tcan 3 dwat 9 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyishrasjlutnyikfrip hpa7tli frusflatprikwisslip hpa7tmwatli nyanhjen hjonli

drutta *Juniperus communis* is an evergreen Shrub growing to 9 m (29ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be

found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Fruit Leaves Seed**Edible Uses:** Coffee Condiment TeaFruit - raw or cooked[2, 5, 9, 15]. It is usually harvested in the autumn when fully ripe and then dried for later use[12]. A soft, mealy, sweet, resinous flesh[82]. The fruit is often used as a flavouring in sauerkraut, stuffings, vegetable pates etc, and is an essential ingredient of gin[183]. The aromatic fruit is used as a pepper substitute according to one report[183]. An essential oil is sometimes distilled from the fruit to be used as a flavouring[183]. Average yields are around 1%[7]. The cones are about 4 - 8mm in diameter and take 2 - 3 years to mature[82, 200]. Some caution is advised when using the fruit, see the notes above on toxicity. The roasted seed is a coffee substitute[177]. A tea is made by boiling the leaves and stems[161]. A tea made from the berries has a spicy gin-like flavour[183].

**tcanta Fibre Fuel Hair Incense Repellent Resin Strewing Tindaer** A decoction of the branches is used as an anti-dandruff shampoo[172]. The essential oil distilled from the fruits is used in perfumes with spicy fragrances[238]. In hot countries the tree yields the resin 'Sandarac' from incisions in the trunk[4, 74]. This is used in the production of a white varnish[74]. The stems were at one time used as a strewing herb to sweeten the smell of rooms[14, 244]. The whole plant can be burnt as an incense and fumigant[66, 102, 146]. It was used during epidemics in the belief that it would purify the air and cleanse it of infection[244]. Fresh or dried juniper branches also make a good insect repellent[102, 172]. Many forms of this species are good ground cover plants for sunny situations[208]. Forms to try include 'Depressa Aurea', 'Dumosa', 'Effusa', and 'Repanda'[197]. 'Prostrata' can also be used[188]. The bark is used as cordage[61] and as a tinder[172]. Wood - strong, hard, fragrant, very durable in contact with the soil and very close-grained, but usually too small to be of much use[82, 229, 244, 245]. It makes an excellent fuel[66].

**dwatta Antiseptic Aromatherapy Aromatic Carminative Diaphoretic Diuretic Rubefacient Stomachic Tonic Urinary** juniper fruits are commonly used in herbal medicine, as a household remedy, and also in some commercial preparations. They are especially useful in the treatment of digestive disorders plus kidney and bladder problems[4]. The fully ripe fruits are strongly antiseptic, aromatic, carminative, diaphoretic, strongly diuretic, rubefacient, stomachic and tonic[4, 7, 9, 21, 46, 165, 240, 254]. They are used in the treatment of cystitis, digestive problems, chronic arthritis, gout and rheumatic conditions[254]. They can be eaten raw or used in a tea[222], but some caution is advised since large doses can irritate the urinary passage[4]. Externally, it is applied as a diluted essential oil, having a slightly warming effect upon the skin and is thought to promote the removal of waste products from underlying tissues[254]. It is, therefore, helpful when applied to arthritic joints etc[254]. The fruits should not be used internally by pregnant women since this can cause an abortion[9]. The fruits also increase menstrual bleeding so should not be used by women with heavy periods[254]. When made into an ointment, they are applied to exposed wounds and prevent irritation by flies[4]. The essential oil is used in aromatherapy. Its keyword is 'Toxin elimination'[210].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until

large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

**nwatta Landscape Uses:**Specimen. An easily grown plant, it succeeds in hot dry soils and in poor soils. Succeeds in most soils so long as they are well drained[186], preferring a neutral or slightly alkaline soil. Does well in chalky soils[1]. Grows well in heavy clay soils. Tolerates a pH range from 4 to 8[186]. Succeeds in light woodland but dislikes heavy shade[186]. Established plants are very tolerant of drought[186]. Although the fully dormant plant is cold-tolerant throughout Britain, the young growth in spring can be damaged by late frosts. All parts of the plant are very aromatic[245]. Juniper is a very polymorphic species that has a long history of culinary and medicinal use[244]. It is frequently grown in the ornamental and herb garden, there is a huge range of cultivars of widely diverse habits[11, 81]. At least some forms tolerate maritime exposure[186], there is a thriving colony in an exposed position at Land's End in Cornwall[81]. The fruits take 2 - 3 years to ripen on the plant[11]. Plants are usually very slow growing, often only a few centimetres a year[186]. Resists honey fungus[88]. Plants are sometimes attacked by a rust, this fungus has an aecidial stage on hawthorn (*Crataegus* spp.)[1]. Dioecious. Male and female plants must be grown if seed is required. **Special Features:** North American native, Fragrant foliage, Inconspicuous flowers or blooms.

## 5.2.192 *Crataegus monogyna*

**Hawthorn, Oneseed hawthorn**  
4 tlin 8 cyuc 3 kcaak 3 tcan 5 dwat m hkuc  
hmmihmtt cyutli hgattcuphja7n hwicli hyishrasjlutnyikrip  
hpa7tli frusflatprikkwisslip hpa7tmwatli xre7t hjonli

**drutta** *Crataegus monogyna* is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Flowers Fruit Leaves**Edible Uses:** Coffee TeaFruit - raw or cooked[2, 12]. Not very appetizing raw[9, K], it is normally used for making jams and preserves[9, 183]. The fruit can be dried, ground, mixed with flour and used for making bread etc[46]. The fruit is about 1cm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K]. Young shoots - raw[5, 177]. A pleasant nutty flavour[144], they are a good addition to the salad bowl[183]. A tea is made from the dried leaves[21, 46, 177, 183], it is a china tea substitute. The roasted seeds are a coffee substitute[12, 21, 46, 177]. The flowers are used in syrups and sweet puddings[183].

**tcanta Fuel Hedge Hedge Wood**A good hedge plant, it is very tolerant of being cut and of neglect and is able to regenerate if cut back severely, it makes a good thorny stock-proof barrier[186] and resists very strong winds. It is often used in layered hedges[11, 29]. The cultivar 'Stricta' has made a very good hedge 3.5 metres tall in an exposed maritime position at Rosewarne in N. Cornwall[K]. Wood - very hard and tough, difficult to work. Used for tool handles etc. Valued in turning[7, 46, 61]. A good fuel, giving out a lot of heat[4].

**dwatta Antispasmodic Astringent Cardiotonic Diuretic Hypotensive Malaria Sedative Tonic Vasodilator**Hawthorn is an extremely valuable medicinal herb. It is used mainly for treating disorders of the heart and circulation system, especially angina[254]. Western herbalists consider it a 'food for the heart', it increases the blood flow to the heart muscles and restores normal heart beat[254]. This effect is brought about by the presence of bioflavonoids in the fruit, these

238]. It warrants scientific investigation[222]. The bark is aromatic, astringent, diaphoretic, febrifuge, stimulant and tonic[61, 149, 227, 257]. It is pleasant to chew[227]. It is used in the treatment of coughs and colds[257]. The bark can be harvested at any time of the year and is used fresh or dried[238]. The fruits are carminative[222]. The oil from the fruits has been used in the treatment of bruises and rheumatism[222]. A tea made from the twigs was a household remedy for colds, fevers, worms and colic[222]. A steam bath of the twigs is used to cause perspiration in order to ease aches and pains in the body[257]. The young shoots are harvested during the spring and can be used fresh or dried[238]. The bark is diaphoretic and vermifuge. It was once widely used as a treatment for typhoid fevers and other forms of fevers[213, 222].

**propta Seed** - best sown as soon as it is ripe in the autumn in a greenhouse. The seed has a short viability and should not be allowed to dry out[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, July in a frame[200]. Cuttings of mature side-shoots, 10 - 12cm with a heel, September/October in a cold frame. They may root by spring. Fair to good percentage[78]. Layering.

**nwatta Landscape Uses:**Border, Pest tolerant, Massing, Woodland garden. Requires a lime-free rather moist soil[200] with a pH in the range 4.5 - 6[238]. Prefers partial shade or dappled sunlight in a fertile moisture-retentive soil enriched with leafmould[200]. Succeeds in full sun or semi-shade[184]. Plants are hardy to about -25°C[184]. The leaves, bark and berries are very aromatic[182, 213]. Plants can be pruned right back to the base if required, though any drastic pruning is best spread over several seasons[200]. Plants in this genus are notably resistant to honey fungus[200]. The fruit has a high fat content and is much eaten by migratory birds to supply their high energy demands when migrating[274]. Dioecious, male and female plants must be grown if seed is required[188, 238]. **Special Features:**Attracts birds, North American native, Fragrant foliage, Wetlands plant, Attracts butterflies, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11 -11 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

## 5.2.229 *Prunus sibirica*

**Siberian Apricot**  
4 tlin 8 cyuc 3 kcaak 4 tcan 2 dwat 3 m hkuc  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

**drutta** *Prunus sibirica* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in March, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit Oil Seed**Edible Uses:** Condiment OilFruit - raw or cooked[2, 105]. A good size, it is about 25mm x 25mm and contains one large seed[200]. Sour and scarcely edible[11, 266]. The fruit is occasionally eaten. Seed - raw or cooked. A bitter taste[11], they are normally used as an almond flavouring[74, 105]. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible

oil is obtained from the seed[183] - it is used as an almond flavouring[74]. The oil resembles olive oil[183].

**tcanta Dye Oil Rootstock**A potential rootstock for apricots[113]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

**dwatta Analgesic Antiasthmatic Antiseptic Antitussive Digestive Emollient Laxative Tonic**The seed is analgesic, antiasthmatic, antiseptic, antitussive and emollient[176]. It is used in the treatment of coughs, asthma, acute or chronic bronchitis and constipation[176]. The seed contains amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

**propta Seed** - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

**nwatta Industrial Crop:** Oil Management: Standard Regional Crop Staple Crop: OilThrives in a well-drained moisture-retentive loamy soil, growing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[11]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. This species is reputed to be hardy to about -50°C and as such is of potential use for conferring greater cold tolerance in breeding programmes with the closely related apricot, *P. armeniaca*. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.230 *Prunus spinosa*

**Sloe - Blackthorn**  
4 tlin 8 cyuc 3 kcaak 4 tcan 2 dwat 3 m hkuc  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

**drutta** *Prunus spinosa* is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Flowers Fruit Seed**Edible Uses:** TeaFruit - raw or cooked[2, 5, 7, 11, 12, 13, 34]. Exceedingly astringent, it is normally cooked but once the fruit has been frosted it loses some of its astringency and some people find they can enjoy it raw[183, K]. The fruit is more usually used in jellies, syrups, conserves etc and as a flavouring for sloe gin and other liqueurs[183]. Some fruits that we ate in December were fairly pleasant raw[K]. In France the unripe fruit is pickled like an olive[183]. The fruit is about 15mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. The leaves are used as a tea substitute[7, 183]. The dried fruits can be added to herbal teas[176]. The flowers are edible and can be crystallised or sugared[183].

**tcanta Cosmetic Dye Hedge Hedge Ink Pioneer Tannin Wood**The bark is a good source of tannin[7]. It is used to make an ink[66]. The juice of unripe fruits is used as a laundry mark[66], it is almost indelible[115]. The pulped ripe fruit is used cosmetically in making astringent face-masks[7]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. The bark, boiled in an alkali, produces a yellow dye[66]. The

acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit **SeedEdible Uses:** Fruit - raw or cooked[11, 82, 105, 183]. The thick juicy flesh is pleasantly acid[183, 229]. The fruit can also be made into jams, preserves etc[82, 183]. The fruit has a tough skin, it can be up to 2cm in diameter and contains one large seed[82, 229]. **Seed** - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

**tcanta Dye WoodA** green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - hard, heavy, close grained[82]. Trees are too small for the wood to be commercially valuable[229].

**dwatta** Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

**propta Seed** - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

**nwatta** Thrives in a well-drained moisture-retentive loamy soil, growing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. A fast-growing but short-lived tree in the wild[229]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. This species is closely related to *P. americana*[200]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2].

### 5.2.227 *Corylus americana*

American Hazel

4 tlin 8 cyuc 3 kcak 2 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli fyif hjonli

**drutta** *Corylus americana* is a deciduous Tree growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Oil **SeedEdible Uses:** Oil**Seed** - raw or cooked in soups, bread, biscuits, sweets etc[63, 101, 183]. The nuts have a thick shell with a small sweet kernel[183], they make an excellent dessert[K]. Although smaller than the seeds of cultivated species, the seed is of the same general quality[270]. Nuts at the 'milk' stage (before they are fully ripe) are softer and sweeter[183]. The seed is rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed,

**tcanta Hedge Hedge Oil**The plant makes a good screening hedge[159].

**dwatta** Astringent **Poultice**A tea made from the bark is astringent[222]. It was used in the treatment of hives and

fevers[222, 257]. A poultice made from the bark is used to close cuts and wounds, treat tumours, old sores etc[222, 257].

**propta Seed** - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

**nwatta** An easily grown plant, it succeeds in most soils including chalk, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does well in a loamy soil[11, 200]. Plants are fairly wind tolerant[1, 11]. This species is cultivated in America for its edible seed, there are some named varieties[61, 183]. This species is of little value in Britain, however, rarely bearing seeds[11]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.228 *Lindera benzoin*

Spice Bush, Northern spicebush, Bush Northern Spice

4 tlin 9 cyuc 3 kcak 3 tcan 3 dwat 3 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli nyanhjen hjonli

**drutta** *Lindera benzoin* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Edible Uses: **Condiment** TeaThe young leaves, twigs and fruit contain an aromatic essential oil and make a very fragrant tea[55, 62, 95, 102, 149, 183]. The twigs are best gathered when in flower as the nectar adds considerably to the flavour[183]. The dried and powdered fruit is used as a substitute for the spice 'allspice'[2, 46, 55, 62, 95, 183]. The fruit is about the size of an olive[245]. The leaves can also be used as a spice substitute[55]. The new bark is pleasant to chew[183].

**tcanta** Disinfectant **Repellent**The leaves contain small quantities of camphor and can be used as an insect repellent and disinfectant[169]. An oil with a lavender-like fragrance is obtained from the leaves[245]. The fruit, upon distillation, yield a spice-scented oil resembling camphor[245]. An oil smelling of wintergreen is obtained from the twigs and bark[245].

**dwatta** Aromatic Astringent **Diaphoretic** **Disinfectant** **Dysentery** **Febrifuge** **Stimulant** **Tonic**Spice bush has a wide range of uses as a household remedy, especially in the treatment of colds, dysentery and intestinal parasites[222,

bioflavonoids are also strongly antioxidant, helping to prevent or reduce degeneration of the blood vessels[254]. The fruit is antispasmodic, cardiac, diuretic, sedative, tonic and vasodilator[4, 9, 21, 46, 165]. Both the fruits and flowers of hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222], they are also used to treat a heart muscle weakened by age, for inflammation of the heart muscle, arteriosclerosis and for nervous heart problems[21]. Prolonged use is necessary for the treatment to be efficacious[222]. It is normally used either as a tea or a tincture[222]. Hawthorn is combined with ginkgo (*Ginkgo biloba*) to enhance poor memory, working by improving the blood supply to the brain[254]. The bark is astringent and has been used in the treatment of malaria and other fevers[7]. The roots are said to stimulate the arteries of the heart[218].

**propta Seed** - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them out in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta** A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Succeeds in all but the very poorest acid soils[186]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to at least -18°C[202]. Hybridizes freely with other members of this genus and with *C. laevigata* in the wild[186, 200]. There are many named forms selected for their ornamental value[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. In heavier shade they quickly become drawn and leggy, eventually dying[186]. An important food plant for the caterpillars of many lepidoptera species[30], there are 149 insect species associated with this tree[24]. Plants are susceptible to fireblight[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.2.193 *Vitis cinerea floridana*

Currant Grape

4 tlin 8 cyuc 3 kcak 0 tcan 0 dwat m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

**drutta** *Vitis cinerea floridana* is a deciduous Climber. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Fruit **Leaves** **SapEdible Uses:** Fruit - raw or dried for winter use[183]. It can also be used in pies, jellies etc. The fruit is about 4 - 6mm in diameter[200] and is borne in bunches. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked. The sap is made into a tasty beverage.

**tcanta** Dye **Rootstock**A yellow dye is obtained from the fresh or dried leaves[168]. Used as a rootstock.

**dwatta** None known

**propta Seed** - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

**nwatta** Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Used in breeding programmes to develop resistant varieties for Florida and other hot areas[183]. There are some named varieties[183]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.194 *Vitis mustangensis*

Mustang Grape

4 tlin 8 cyuc 3 kcak 0 tcan 0 dwat m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

**drutta** *Vitis mustangensis* is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Fruit **Leaves****Edible Uses:** Fruit - raw, cooked or dried for winter use[105, 161, 177]. Tough skinned, they are used mainly for pies and jellies[183]. A disagreeable flavour[11, 200]. The fruit is about 16mm in diameter[200] and is borne in bunches. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

**tcanta** DyeA yellow dye is obtained from the fresh or dried leaves[168].

**dwatta** None known

**propta Seed** - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the

first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.195 *Erythronium albidum mesochoreum*

Prairie Trout Lily

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium albidum mesochoreum is a BULB growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaкта Edible Parts: RootEdible Uses: Bulb - raw or cooked[105, 161]. Rather small, it is about 20mm long[235]. The bulbs are eaten avidly by children[257]. Young leaves - raw or cooked. Crisp, tasty, tender and mild when eaten raw[183]. Eating the leaves will greatly reduce the vigour of the bulb, so can only be recommended in times of emergency[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division in summer as the leaves die down. This species does not produce offsets[200].

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. This species is unsatisfactory in cultivation outdoors in Britain. It comes into growth early in the year and the flowers probably need more heat than our typical spring provides if they are to open properly[90]. Because stolons are absent in Erythronium mesochoreum, most plants in a population produce flowers; nonflowering plants may sometimes appear after flowering plants have flowered[270]. Flowers are produced in 3 - 4 years from seed[164]. This species does not produce offsets[200].

## 5.2.196 *Allium macropetalum*

Largeflower Wild Onion

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Allium macropetalum is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaкта Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[161, 257]. They can be dried and stored for winter use[257]. The North American Indians would singe the bulb to reduce the strong flavour and then eat it immediately or dry it for later use[257]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.197 *Quercus muehlenbergii*

Yellow Chestnut Oak, Chinkapin oak

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus muehlenbergii is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen in November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaкта Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. It is up to 18mm long[227]. The seed contains very little bitter tannin, it is quite sweet and rather pleasant eating[183, 227]. Tastes nice when baked in an oven[183]. Any bitter seeds can be leached by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method

kcaкта Edible Parts: Flowers FruitEdible Uses: TeaFruit - raw or cooked[105, 161, 257]. A bitter flavour[183]. The fruit is quite nutritious, having a relatively high fat and protein as well as carbohydrate content[212]. The fruit can be dried prior to use, it will then lose some of its rank taste[183]. The fruit is about 5mm in diameter and is borne in large clusters making it easy to harvest[200]. Some caution is advised, see the notes above on toxicity. Flowers - raw or cooked. The root is made into a tea-like beverage[105, 161, 183].

tcanta MusicalThe stem is easily hollowed and can be used to make a whistle[212].

dwatta Diuretic PurgativeThe bark and the leaves are used as a diuretic and purgative[212]. The blossoms have been used in the treatment of measles[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[1, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Closely related to *S. racemosa* and considered part of that species by some botanists[43]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.224 *Staphylea trifolia*

American Bladder Nut

4 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Staphylea trifolia is a deciduous Shrub growing to 4 m (13ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaкта Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[161, 177]. They are eaten like pistachios[2]. The seed can be used in place of walnuts (*Juglans* spp) in making chocolate-chip cookies[183]. A sweet edible oil is obtained from the seed[2]. It is used for cooking purposes[183].

tcanta Oil Soil stabilizationPlants have dense underground root systems and are of some value in erosion control[229].

dwatta SkinAn infusion of the powdered bark has been used as a wash for sore faces[257].

propta Seed - this can be very slow to germinate, sometimes taking 18 months or more. It is best sown as soon as it is ripe in a cold frame[200], and some of it at least should then germinate in the spring. Stored seed should be sown as early in the year as possible and given cold stratification - it might not germinate until spring of the following year. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first winter. Plant them out early the following summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Fair to good percentage[78]. Layering in July/August. Takes 15 months. Good percentage[78].

nwatta Tolerant of a wide range of soils so long as they are not too dry[11, 182, 200], it prefers a rich loamy soil in full sun or semi-shade[200]. A fast-growing but short-lived tree in the wild[229]. The plants flower best in years that

follow hot summers[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.225 *Amelanchier bartramiana*

Oblongfruit serviceberry

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyfekre7t hjonli

drutta Amelanchier bartramiana is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaкта Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[101, 105, 161]. The fruit contains a few small seeds at the centre, it is sweet but rather dry according to one report[177] whilst others have found it to be sweet and juicy[183, K]. The fruit can be added to pancakes or dried for later use[183]. Fruits are oval or pear shaped unlike other members of this genus that have round fruits[183]. They are 15mm long[200]. The fruit is rich in iron and copper[226].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil, including chalk, so long as it is not too dry or water-logged[11, 200]. Grows well in heavy clay soils. Plants are hardy to about -30°c[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. This species hybridises with *A. sanguinea*, *A. humilis*, *A. stolonifera*, *A. fernaldii* and *A. canadensis*. Grafting onto seedlings of *A. lamarkii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 5.2.226 *Prunus alleghaniensis*

Allegheny Plum, Davis' plum

4 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 3.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Prunus alleghaniensis is a deciduous Tree growing to 3.5 m (11ft 6in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly



species is notably resistant to honey fungus[88, 200]. Special Features: North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.221 Decaisnea fargesii

Blue Sausage Fruit

4 tlin 8 cyuc 3 ckaak 0 tcan 0 dwat 4 m hkuc  
hmmihmt cyutli tcup hwicli hrasjltunykrip hpa7tli flatprikliwis hpa7tmwatli fyfcre7t hjonli

drutta Decaisnea fargesii is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from April to October, in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw[1, 105]. A sweet taste, but rather insipid[109]. A very nice delicate flavour according to our palates[K]. The fruit looks like a bright blue sausage or broad bean pod[K] and is up to 10cm long[200]. You peel off the skin in much the same way as you would peel a broad bean pod, this reveals a line of seed running the entire length of the fruit surrounded by a relatively thin layer of flesh[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200], it then usually germinates freely in early spring[K]. Sow stored seed in February in a greenhouse. This usually germinates well, within 1 - 3 months at 18°C[175]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on under protection for their first winter. Plant out in late spring after the last expected frosts. Cuttings.

nwatta An easily grown plant[182] succeeding in most soils[202], but it prefers a rich moist loamy soil and a sunny position sheltered from cold winds[175, 200]. Succeeds in partial shade[200]. Prefers partial shade, succeeding in full sun if the soil is reliably moist[202]. Dislikes drought[K]. A very cold-hardy plant when fully dormant, but the flowers and young growth in spring can be damaged by late frosts[11, 200]. Plants usually fruit well and regularly in Cornwall[11, 58] and a specimen has been seen on a number of occasions at Kew Botanical gardens laden down with fruit[K]. The flowers are produced at the tips of the new upright growths in the spring[11, 202]. Plants take some years from seed to produce fruit[202]. A very ornamental plant[1]. It is fairly fast growing but it looks gaunt and open in the winter[182]. Plants do not usually require pruning[202]. In some new florals, this species is seen as no more than a synonym for *D. insignis*[266]. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones

11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2].

## 5.2.222 Sambucus racemosa

American Red Elder

4 tlin 8 cyuc 3 ckaak 1 tcan 1 dwat 4 m hkuc  
hmmihmt cyutli tcup hwicli hrasjltunykrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sambucus racemosa is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

ckakta Edible Parts: Flowers FruitEdible Uses: Fruit - raw or cooked[105, 161, 257]. A bitter flavour[183]. The fruit is quite nutritious, having a relatively high fat and protein as well as carbohydrate content[212]. The fruit can be dried prior to use, it will then lose some of its rank taste[183]. The fruit is about 5mm in diameter and is borne in large clusters making it easy to harvest[200]. Some caution is advised, see the notes above on toxicity. Flowers - raw or cooked. The root is made into a tea-like beverage[105, 161, 183].

tcanta Repellent Straw WoodThe stem is easily hollowed and can be used to make a whistle[212].

dwatta Anodyne Carminative Depurative Diaphoretic Diuretic Laxative Purgative Resolvent Vitamin C Vulnerary-The bark and the leaves are used as a diuretic and purgative[212]. The blossoms have been used in the treatment of measles[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Closely related to *S. racemosa* and considered part of that species by some botanists[43]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.223 Sambucus pubens

American Red Elder

4 tlin 8 cyuc 3 ckaak 1 tcan 1 dwat 4 m hkuc  
hmmihmt cyutli tcup hwicli hrasjltunykrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sambucus pubens is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency Roasted seed is a coffee substitute.

tcanta Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - heavy, very hard, strong, close grained, durable. It weighs 53lb per cubic foot[227]. Not abundant enough to be used commercially, it is used for fencing, cooperage etc and makes an excellent fuel[82, 149, 229].

dwatta Antiemetic Astringent DysenteryAn infusion of the bark has been used in the treatment of vomiting[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses: Pest tolerant, Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Growth is fairly rapid for an oak[227], especially when the tree is young, though it slows down with age[229]. Seed production is cyclic, a year with high yields is followed by 2 - 3 years of light crops[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Q. muhlenbergii brayi (Small.)Sarg. has somewhat larger seeds than the type, sometimes 3cm long[227]. Closely related to Q. prinus[11]. Trees are often confused with Q. prinus, Q. prinoides and Q. michauxii[200]. Trees respond well to coppicing[149]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 2. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

## 5.2.198 Malus spectabilis

Chinese Flowering Apple, Asiatic apple

4 tlin 8 cyuc 3 ckaak 0 tcan 0 dwat 9 m hkuc  
hmmihmt cyutli tcup hwicli hrasjltunykrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Malus spectabilis is a deciduous Tree growing to 9 m (29ft) by 9 m (29ft). See above for USDA hardiness. It

is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105]. About 2 - 3 cm in diameter[200]. Bitter and harsh when eaten fresh[11], when stored in a cool dry place and allowed to bleed it becomes quite acceptable[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. A very ornamental tree[1], it is much cultivated in China for its edible fruit[11]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.199 Eryngium maritimum

Sea Holly, Seaside eryngo

4 tlin 8 cyuc 3 ckaak 2 tcan 3 dwat m hkuc  
htut cyutli hgatkyuuctup hwicli hyishrasjrlut hpa7tli flatprikliwisliphsom hpa7tmwatli fyfcre7t hjonli

drutta Eryngium maritimum is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckakta Edible Parts: Leaves Root ShootsEdible Uses: Young shoots - cooked[46, 61, 66]. They are normally blanched by excluding light from the growing plant, and are then used as an asparagus substitute[2, 115, 183]. They are said to be palatable and nourishing[4]. Root - cooked[2]. Used as a vegetable or candied and used as a sweetmeat[5, 66, 115]. Palatable and nutritious[4], it is slightly sweet and smells of carrots[13]. The boiled or roasted roots are said to resemble parsnips or chestnuts in flavour[2, 183].

tcanta Soil stabilizationThe extensive root system helps to bind sand on the sea shore[13].

dwatta Aphrodisiac Aromatic Diaphoretic Diuretic Expectoant Stimulant TonicSea holly roots were collected on a large scale in the 17th and 18th centuries in England and were candied then used as restorative, quasi-aphrodisiac lozenges[238]. The plant is still used in modern herbalism where it is valued especially for its diuretic action[254]. The root is to be aphrodisiac, aromatic, diaphoretic, diuretic, expectoant, stimulant and tonic[4, 165, 200]. The root promotes free expectoration and is very useful in the treatment of debility attendant on coughs of chronic standing in the advanced stages of pulmonary consumption[4]. It is used in the treatment of cystitis, urethritis, as a means to alleviate kidney stones (it is unlikely that it dissolves the stones, but

it probably helps to retard their formation), and to treat enlargement or inflammation of the prostate gland[254]. Drunk freely, it is used to treat diseases of the liver and kidneys[4, 238]. Used externally as a poultice, the dried powdered root aids tissue regeneration[268]. The root should be harvested in the autumn from plants that are at least 2 years old[4].

propta Seed - best sown as soon as it is ripe in early autumn on the surface of a well-drained compost in a cold frame[200]. The seed can also be sown in spring. Germination can be very slow[4], although another report says that the seed usually germinates in 5 - 90 days at 20°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring or autumn. Take care since the plant resents root disturbance[200]. Root cuttings in autumn or winter[200].

nwatta Requires a deep well-drained soil and a sunny position[1]. Prefers a light sandy saline soil but tolerates most soil types including lime and poor gravels[200, 268]. Plants are best grown in a hot dry position[187, 233]. Established plants are drought tolerant[190]. Plants are hardy to about -15°C[187]. Sea holly has very long roots that penetrate deeply in the soil and are often several feet long[4]. These roots are sweetly scented[245]. The plant should be placed in its final position whilst small since it resents root disturbance[200]. Although a sea-shore plant, it is amenable to garden cultivation[4]. A good bee plant[108]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.200 Crataegus opaca

Western Mayhaw
4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 9 m hkuc
hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli frusflatprikkwis hpa7tmwatli xre7t hjonli

drutta Crataegus opaca is a deciduous Shrub growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[160]. Juicy and acid with a pleasant flavour[2]. It is up to 2cm in diameter[227]. The fruit is frequently used and much prized in parts of southern N. America where it is often gathered in quantity from the wild. Its acid flavour makes it a favourite for preserves and jellies[82, 183, 227]. The fruit can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard and strong, but not large enough for commercial use[227]. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year.

Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. It thrives in acid soils[160]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy species, tolerating temperatures down to about -30°C[160]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. Occasionally cultivated for its fruit in America, there are some named varieties[183].

### 5.2.201 Castanea crenata

Japanese Chestnut
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 9 m hkuc
hmimhtut cyutli hgatkyuctup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea crenata is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[1, 46, 61]. A good potato substitute[63, 105, 142, 171]. A source of starch[177]. Very poor flavour[142]. Coarse and of little value. Very variable in size and quality, any astringency can be removed by boiling the seed in salty water[183].

tcanta Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - hard, strong, light, very durable. Used for furniture, construction, fence posts etc[46, 61].

dwatta None known

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants

this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. This species is closely related to *C. douglasii*[71].

### 5.2.219 Castanea x neglecta

Chinknut

4 tin 8 cyuc 3 kcaak 3 tcan 0 dwat 4 m hkuc
htut cyutli hgatkyuctup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea x neglecta is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[183]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K]. The seed is quite small, though it is larger than *C. pumila*[11]. Another report says that only one large seed is formed in each seed case[82].

tcanta Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - coarse-grained, hard, strong, light, durable, easy to split.

dwatta None known

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K]. This species is a natural hybrid and might not breed true from seed[K]. Division of suckers in winter[200]. They can be planted straight out into their permanent positions.

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. This species is an excellent soil-enriching understorey in pine forests[200], growing and fruiting well so long as the canopy of pines is fairly light. Although it is very winter-hardy, this species only really thrives in areas with hot summers[200]. This species is a natural hybrid, *C. dentata* x *C. pumila*[11, 200]. It is very similar to *C. pumila*[270], but has larger fruits than *C. pumila*[11] and often produces two fertile seeds in each fruit[270].. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Fruits are produced in 2 - 3 years from seed[117]. This species is occasionally cultivated for its edible seed in N. America, there are some named varieties[183]. The plants produce seeds abundantly in the wild[183]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.220 Quercus gambelii

Shin Oak, Gambel oak, Rocky Mountain White Oak
4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 4.5 m hkuc
hmimhtut cyutli kyuctup hwicli jlutnyik hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta Quercus gambelii is a deciduous Shrub growing to 4.5 m (14ft 9in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[257]. A staple food for several native North American Indian tribes[257]. A sweet taste[61, 62, 63, 85, 161]. The seed is about 2cm long and wide[82, 200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. If the seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost[85]. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Buttons Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The seed cups are used as buttons[5]. Wood - hard, heavy, close-grained. The trees are generally too small to be of use commercially, though the wood is used locally for lumber and also makes a good fuel[229].

dwatta Analgesic Astringent Cathartic DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. The acorns have been eaten to give greater sexual potency[257]. The root bark is analgesic and cathartic[257]. A decoction has been used to treat postpartum pain and facilitate delivery of the placenta[257].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly. Division of suckers in the dormant season[11].

nwatta Landscape Uses:Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. A slow growing shrub that often produces suckers and grows as a thicket[182, 229], it occasionally makes a small tree[229]. Seed production is cyclical, a year when good crops are produced is followed by several years of light production[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Hybridizes freely with other members of the genus[200]. This

The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Hybridizes freely with other members of this genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.217 Crataegus anomala

Arnold hawthorn

4 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 5 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus anomala is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177, 235]. Juicy[43]. A very nice flavour, it makes a very good dessert fruit[K]. The fruit can also be used in making pies, preserves, etc, and can be dried for later use. The fruit is up to 20mm in diameter with a thick flesh[235]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. This species is growing in a number of botanical gardens in Britain, where it is fruiting

very well[K]. Some botanists do not recognise it as a distinct species and place it as part of *C. pedicellata*[82]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.218 Crataegus columbiana

Columbian Hawthorn

4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 5 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus columbiana is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[161, 166]. A very pleasant flavour, it is slightly mealy but juicy and can be eaten in quantity as a dessert fruit[K]. It is also used in making pies, preserves etc and can be dried for later use[161, 177]. The fruit is up to 11mm in diameter and is borne in small clusters[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of

can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Industrial Crop: Tannin Management: Standard Regional Crop Staple Crop: Balanced carbPrefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. The majority of species in this genus only really thrive in areas with hot summers, though this species is better adapted to British conditions than most[200]. Cultivated for its edible seed in Japan, there are many named varieties[58, 63, 183]. It is often also cultivated for its seed in America because it is fairly resistant to chestnut blight[171, 200]. Individual trees are very variable with regard to size of the seed, resistance to blight and astringency of the seed[183]. Some cultivars have the largest seeds of any member of this genus. Trees fruit freely when only 3 - 3.5 metres tall[11]. This species is occasionally planted as a timber tree in S. Europe[50]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.202 Corylus cornuta californica

California Hazel

4 tlin 8 cyuc 3 kcaak 4 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyif hjonli

drutta Corylus cornuta californica is a deciduous Shrub growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[177]. Eaten fresh or preserved for winter use[183]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta Biomass Fencing Fibre Oil PaperA fibre is obtained from the inner bark and is used to make paper[189]. The branches are removed in the autumn, the leaves removed and the branches steamed then the fibre is removed[189]. The fibres are cooked for two hours with lye and then put through a blender[189]. It makes a brown paper[189]. The fibre is also used for cordage[189].

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wind tolerant[1, 11]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

## 5.2.203 Malus sieversii

Crabapple

4 tlin 10 cyuc 3 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Malus sieversii is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Large and well-flavoured[74]. The fruit is usually between 3 - 5cm in diameter, though it can be up to 7cm[266].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. This species is vulnerable to extinction because of its limited range and exploitation[266]. It is believed to be the principal ancestor of commercially grown apples[266]. A parent of the cultivated apple[11], the large well-flavoured fruit is possibly of economic interest[74]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.204 Amelanchier asiatica

Korean Juneberry

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Amelanchier asiatica is a deciduous Tree growing to 8 m (26ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit, raw or cooked[3, 105, 177]. Of good quality[183], the fruit is sweet and juicy, contains a few small seeds at the centre and has a hint of apple in the flavour[K]. The fruit is rich in iron and copper[226]. The fruit is up to 15mm in diameter[266].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in

the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil, including chalk, so long as it is not too dry or water-logged[11, 200]. Plants succeed in quite shady positions but do not flower or fruit well there[K]. Grows well in heavy clay soils. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. A very ornamental plant[1], it is closely allied to *A. canadensis* and *A. laevis*, and is also very similar to *A. arborea*[11]. The sub-species *A. asiatica sinica* C. Schneid. is found in China. It has smaller fruits than the type species[200]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 5.2.205 *Crataegus pedicellata gloriosa*

Scarlet Haw

4 tin 8 cyuc 3 kcaak 3 tcan 2 dwat 7 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjltunykfrrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Crataegus pedicellata gloriosa* is a deciduous Shrub growing to 7 m (23ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. Up to 2cm long and pear shaped[11]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up

the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Plants are hardy to at least -18°C[202]. This sub-species has larger fruits than the type[11]. Hybridizes freely with other members of this genus[200]. Seedlings trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 5.2.206 *Corylus heterophylla*

Siberian Filbert

4 tin 8 cyuc 3 kcaak 4 tcan 1 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikwisslip hpa7tmwatli fyif hjonli

drutta *Corylus heterophylla* is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[46, 61, 105, 177]. The seed, which has a hard shell, is of relatively good flavour[183]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta OilNone known

dwatta Appetizer DigestiveThe seed is digestive and appetizer[218].

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Management: Coppice Management: Standard Other Systems: Strip intercrop Regional Crop Staple Crop: Protein-oilAn easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in

with balsamic undertones[245]. Hybridizes freely with other members of this genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 5.2.215 *Aralia elata*

Japanese Angelica Tree, Angelica Tree

4 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hyishrasjltunyk hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Aralia elata* is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves ShootsEdible Uses: Young shoots - cooked[177, 200]. They can also be blanched and used in salads. The young shoots of *Aralia elata* are a popular wild food in Japan where the tree is known as Taranoki and the shoots as Taranome. In Korea the shoots are called dureup.

tcanta Landscape Uses: Specimen. Special Features: Not North American native, Blooms are very showy, attracts wildlife. Nectary - Shelter [1-2].

dwatta Anodyne Cancer CarminativeThe roots and stems are anodyne and carminative[147]. All parts of the plant are used for the treatment of rheumatoid arthralgia, coughs, diabetes, jaundice, stomach ulcers and stomach cancers[147, 218].

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Prefers a good deep loam and a position in semi-shade but it also succeeds in a sunny position[11, 200]. Requires a sheltered position. Plants are hardier when grown on poorer soils[11, 200]. Prefers an acid soil[184]. Dormant plants are hardy to at least -15°C[184, 200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A very ornamental species, there are a number of named varieties. It is usually a single stemmed shrub, spreading by means of suckers[182]. This species is closely allied to *A. chinensis*. In Japan *Aralia elata* is a pioneering plant that often grows where forests have been cleared. In open sunny areas with adequate soil moisture it grows rapidly. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 5.2.216 *Crataegus chrysoarpa*

Fireberry Hawthorn, Red haw, Piper's hawthorn, 4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 6 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjltunykfrrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Crataegus chrysoarpa* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[161, 177]. Used mainly as a famine food[257]. A very pleasant flavour when ripe, with the added bonus of ripening in late summer before most other members of the genus[K]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. It is about 1cm in diameter and borne in small clusters[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K]. A tea can be made from the twigs[257]. (This probably means the young shoots with leaves[K].)

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic Hypotensive LaxativeA decoction of the dried berries has been used as a mild laxative[257]. A compound decoction of the root has been used in the treatment of diarrhoea[257]. Although no other specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. A ten year old tree was seen at Kew Gardens in 2002. It was about 2.5 metres tall and was bearing a very good crop of fruit[K].

well in quite dense shade[17, 186]. A very hardy plant, tolerating temperatures down to at least -18°C[202]. Hybridizes freely with other members of this genus[200]. Closely allied to *C. monogyna*, it often hybridizes with that species in the wild when growing in its proximity[186]. There are many named forms selected for their ornamental value[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. An important food plant for the larvae of many lepidoptera species[30]. Special Features: Not North American native, Blooms are very showy.

## 5.2.213 Amelanchier intermedia

June berry,  
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 6 m hkuc  
hmmihmtt cyutli tcup hwicli hrasjutnykfrp hpa7tli flatprik hpa7tmwatli fyfxfre7t hjonli  
drutta *Amelanchier intermedia* is a deciduous Shrub growing to 6 m (19ft) by 4 m (13ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit/Edible Uses: Edible fruit - raw or cooked[11]. We have yet to see the fruit on this species, but if it is like the closely related *A. lamarkii*, then it will be sweet and succulent with a flavour of apples[K]. The fruit can also be dried for later use and is up to 10mm in diameter. The fruit is rich in iron and copper[226].

tcanta None known  
dwatta None known  
propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Prefers an acid or neutral soil. Plants are hardy to about -25°C[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main drawback to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Considerable confusion has existed between this species and *A. arborea*, *A. canadensis* and *A. laevis*, see [1] for the latest (1991) classification. Some botanists consider this species to be part of *A. canadensis* or *A. lamarkii*[11, 200]. A group of plants growing at Kew were about 5 years old in 1995. They were flowering well in early April, were about 2 metres tall and had lots of side branches[K]. Their native range was given as western N. America, which conflicts with other reports[K]. Older plants are being grown at Hilliers Arboretum in Hampshire, in early April 1999 they were 4 metres

tall, suckering quite freely in a tight clump and flowering very freely[K]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 5.2.214 Crataegus coccinoides

Kansas Hawthorn  
4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 6 m hkuc  
hmmihmtt cyutli hgatkuyctcuphja7n hwicli hrasjutnykfrp hpa7tli flatprikwiissip hpa7tmwatli xre7t hjonli  
drutta *Crataegus coccinoides* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit/Edible Uses: Fruit - raw or cooked[2, 177]. Firm and sub-acid[82]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. The fruit is borne in small clusters and is up to 17mm in diameter[229]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].  
tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic Hypotensive/Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent

rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wild tolerant[1, 11]. This species is cultivated in Asia for its edible seed[61] but it is of little value as a nut bearer in Britain[1]. Closely related to *C. avellana*[1]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

## 5.2.207 Malus coronaria

Garland Crab, Sweet crab apple  
4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 7 m hkuc  
hmmihmtt cyutli tcuphja7n hwicli hrasjutnykfrp hpa7tli flatprikwis hpa7tmwatli xre7t hjonli  
drutta *Malus coronaria* is a deciduous Tree growing to 7 m (23ft) by 7 m (23ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Fruit/Edible Uses: Pectin/Fruit - raw or cooked[159, 161]. Fairly large, it is up to 5cm in diameter[200]. Harsh and acid[11], it is mainly used for jellies[183] but can be eaten raw when it is fully ripe[101]. The fruits can be buried in the ground overwinter and will have lost much of their acidity by the spring[183]. The fruit can also be dried and stored for later use[257]. Rich in pectin, so it can be added to pectin-low fruits when making jams or jellies[226]. Pectin is also said to protect the body against radiation[201].

tcanta Pectin Rootstock Wood/The plant can be used as a rootstock for cultivated apples, conferring a greater hardness[226]. Wood - heavy, close-grained, not strong[46, 82, 229]. It weighs 43lb per cubic foot[235]. Used for making levers, the handles of tools, small domestic items and fuel[46, 82, 229].

dwatta Abortifacient Astringent Birthing aid Emmenagogue Lithotropic Ophthalmic/An infusion of the bark has been used to ease a difficult birth and also in the treatment of gallstones, piles and as a wash for sore mouths[257]. A cold infusion of the bark has been used as a wash for black eyes, sore eyes and snow blindness[257]. A decoction of the root has been used to treat suppressed menses and so can cause an abortion, especially early in the pregnancy[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. A slow-growing and short-lived tree in the wild[229]. The fruit is a good wildlife food source, especially for birds[200]. The flowers are sweetly scented[245]. This species is closely related to *M. ionensis*[1]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.208 Crataegus altaica

Altai Mountain Thorn  
4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 6 m hkuc  
hmmihmtt cyutli hgattcuphja7n hwicli hrasjutnykfrp hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Crataegus altaica* is a deciduous Tree growing to 6 m (19ft) by 4 m (13ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. The species

is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Fruit - raw or cooked. About 8mm in diameter, the fruit is yellow with a fairly dry mealy texture and a pleasantly sweet flesh[K]. The fruit can also be used in making pies, preserves, etc, and can also be dried for later use. The fruit ripens in August, making it one of the earliest ripening hawthorns[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. This species is closely related to *C. wattiana*[11]. Hawthorns in general hybridize freely with other members of the genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.209 Xanthoceras sorbifolium

Yellowhorn  
4 tin 7 cyuc 3 kcaak 0 tcan 0 dwat 6 m hkuc  
htut cyutli kyuctcup hwicli hrasjutnyk hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Xanthoceras sorbifolium* is a deciduous Shrub growing to 6 m (19ft) by 2.5 m (8ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 6 and

is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Leaves Seed**Edible Uses:** Flowers - cooked[2, 105, 183]. They are usually boiled[179]. Leaves - cooked[2, 105, 183]. They are usually boiled[179]. Seed - cooked[2, 105, 177]. The seed is about the size of a pea, it is quite sweet[183], with a taste like a sweet chestnut[178]. The seed is husked and then ground into a powder and boiled[179].

**tcanta None known**  
**dwatta None known**  
**propta Seed - 3 months** cool stratification improves germination rates[113] so the seed is probably best sown in a cold frame in the autumn[K]. Another report says that the seed can be sown in a warm greenhouse in February or March[78], probably after stratification[K]. When large enough to handle, prick the seedlings out into individual pots. Grow the on in a lightly shaded position in a greenhouse for their first winter then plant them out into their permanent positions in late spring or early summer. Consider giving them some protection from winter cold for their first winter or two outdoors. Root cuttings, 3cm long planted horizontally in pots in a frame in December or January. Good percentage[78]. Division of suckers in the dormant season[200]. They can be planted out straight into their permanent positions.

**nwatta Management:** Standard Other Systems: Strip intercrop Regional Crop Staple Crop: Protein-oilPrefers a good loamy soil[1], but succeeds in most well-drained fertile soils in a sunny position[184, 200]. Prefers a warm dry situation[184]. Requires protection from cold winds[202]. Dormant plants are hardy to about -20°C[184]. They grow best in areas with warm summers and dry springs without late frosts[184], the young growth can be damaged by late spring frosts[1, 11]. They require summer heat in order to fully ripen their wood and to stimulate the production of flower buds[11, 200]. They are subject to attacks by 'coral spot' fungus, particularly if the wood is not fully ripened and is then damaged by winter cold[11]. Flowers are produced on the previous year's wood[202]. Plants are usually slow to become established[202]. **Special Features:**Not North American native, Fragrant flowers, Blooms are very showy. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 5.2.210 Crataegus flabellata

Fanleaf hawthorn  
4 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli  
drutta Crataegus flabellata is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. A sweet but very soft and mealy flesh, it makes an acceptable dessert fruit[K]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. The fruit is up to 15mm long and 8mm wide, it is borne in small clusters[82, 229]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood - heavy, hard, tough, close-grained.** Useful for making tool handles, mallets and other small items[82].

**dwatta Cardiotoxic Hypotensive**Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

**propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year.** Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta A** very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A tree at Kew in September 1993 was fruiting heavily[K].

## 5.2.211 Crataegus pruinosa

Frosted Hawthorn, Waxypfruit hawthorn  
4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli  
drutta Crataegus pruinosa is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[105, 161, 177]. The flesh is thick[82]. A sweet yellow flesh[200]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use[257]. The fruit is about 1cm in diameter[200]. The fruit is up to 16mm in diameter with a thin flesh[229]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood - heavy, hard, tough, close-grained.** Useful for making tool handles, mallets and other small items[82].

**dwatta Cardiotoxic Hypotensive**Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

**propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year.** Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta A** very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.212 Crataegus laevigata

Midland Hawthorn, Smooth hawthorn, English Hawthorn  
4 tlin 8 cyuc 3 kcaak 5 tcan 5 dwat 6 m hkuc  
pcimhmimhtut cyutli hgattcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

**drutta Crataegus laevigata** is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit Leaves**Edible Uses:** Coffee TeaFruit - raw or cooked[2, 9, 12, 183]. A dry and mealy texture, they are not very appetizing[K]. The fruit can be used for jams and preserves[9]. The fruit pulp can be dried, ground into a meal and mixed with flour in making bread etc[46, 183]. The fruit is about 1cm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these

often stick together and so the effect is of eating a cherry-like fruit with a single seed[K]. Young leaves and young shoots - raw[5, 177]. A tasty nibble, they are nice in a salad[K]. Young leaves are a tea substitute[21, 46, 177, 183]. The roasted seed is a coffee substitute[12, 21, 183].

**tcanta Charcoal Fuel** Hedge Rootstock WoodA good hedge plant, it is very tolerant of neglect and is able to regenerate if cut back severely, it makes a good thorny stockproof barrier[186] and resists very strong winds. It can be used in layered hedges[11, 29]. The plant is often used as a rootstock for several species of garden fruit such as the medlar (*Mespilus germanica*) and the pear (*Pyrus communis sativa*)[4]. Wood - very hard and tough but difficult to work[7, 46, 61]. It has a fine grain and takes a beautiful polish but is seldom large enough to be of great value[4]. It is used for tool handles and making small wooden articles etc[4, 7, 46, 61]. The wood is valued in turning and makes an excellent fuel, giving out a lot of heat, more so even than oak wood[4]. Charcoal made from the wood is said to be able to melt pig iron without the aid of a blast[4].

**dwatta Antiarrhythmic Antispasmodic Astringent Cardiotoxic Diuretic Hypotensive Malaria Sedative Tonic Vasodilator**Hawthorn is an extremely valuable medicinal herb. It is used mainly for treating disorders of the heart and circulation system, especially angina[254]. Western herbalists consider it a 'food for the heart', it increases the blood flow to the heart muscles and restores normal heart beat[254]. This effect is brought about by the presence of bioflavonoids in the fruit, these bioflavonoids are also strongly antioxidant, helping to prevent or reduce degeneration of the blood vessels[254]. The fruit is antispasmodic, cardiac, diuretic, sedative, tonic and vasodilator[4, 9, 21, 46, 165]. Both the fruits and flowers of hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222], they are also used to treat a heart muscle weakened by age, for inflammation of the heart muscle, arteriosclerosis and for nervous heart problems[21]. Prolonged use is necessary for the treatment to be efficacious[222]. It is normally used either as a tea or a tincture[222]. Hawthorn is combined with ginkgo (*Ginkgo biloba*) to enhance poor memory, working by improving the blood supply to the brain[254]. The bark is astringent and has been used in the treatment of malaria and other fevers[7]. The roots are said to stimulate the arteries of the heart[218].

**propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year.** Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta Landscape Uses:**Border, Espalier, Pollard, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A true woodland species, it grows



The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Succeeds in most soils, but it prefers a moist loam and lots of leaf mould[42]. Requires a deep rich soil[1]. Grows well in full sun or partial shade[42], doing well in a woodland garden[230]. It also succeeds in a sunny dry border or on a scree[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants seem to be immune to the predations of rabbits[233]. The flowers have a fairly pleasant odour from a distance, but an unpleasant fur-like smell near to which is more pronounced at night-fall and as the flowers begin to fade[245]. Cultivated plants are very susceptible to the predation of slugs and snails[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1].

### 5.2.412 Cotoneaster microphyllus

4 tlin 8 cyuc 2 kcaak 3 tcan 1 dwat m hkuc hmimhtut cyutli kyuctup hwicli hyishraslutnykfrp hpa7ti flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cotoneaster microphyllus is an evergreen Shrub growing to 1 m (3ft 3in) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf year round, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[272]. It is sweet when fully ripe[158]. A watery flavour[272]. It is possibly edible[177]. The fruit is about 7mm in diameter[200].

tcanta Basketry Dye Incense Soil stabilization WoodA rose-tan dye is obtained from the fruit. The leaves are used for incense[272]. The plant has an extensive root system and a creeping habit above ground. It makes a good soil binder[272]. The sub-species C. microphyllus cochleatus can be used as a ground cover plant in a sunny position[188, 208]. It forms a dense carpet of growth[208]. The branches are used for making baskets[146, 158, 272]. Wood - hard, close and even grained[146, 158]. Used for fuel[272].

dwatta AstringentThe stolons are said to be astringent[240].

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°c and then 3 months

cold stratification at 4°c[164]. The seed usually germinates within 1 - 18 months at 15°c but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

nwatta An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Tolerates atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -25°c[184, 200]. A very ornamental plant[1], there are some named forms[202]. Most forms are quite slow-growing[200, 202]. It hybridizes freely with other members of this genus[200] and often self-sows in British gardens[219]. A low-growing plant, the branches often root when they come into contact with the soil[219]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Plants are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

#### 5.2.413 Malus x micromalus

Kaido Crab Apple

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hraslutnykfrp hpa7ti flatpriklwis hpa7tmwatli xre7t hjonli

drutta Malus x micromalus is a deciduous Shrub growing to 4 m (13ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. About 15mm in diameter[200].

tcanta RootstockUsed as a rootstock for the cultivated apple, *M. sylvestris domestica*, it is said to be the best dwarfing rootstock from seed[183].

dwatta None known

propta Seed - this is a hybrid species and will not breed true. The seed is best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.414 Pyrus elaeagnifolia kotschyar

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli hgatyuctup hwicli hraslutnykfrp hpa7ti flatpriklwis hpa7tmwatli xre7t hjonli

dwatta None known

propta Seed - sow spring in situ. Make sure to water the seed in if the weather is dry.

nwatta Succeeds in ordinary garden soils, including heavy clays[200].

### 5.2.274 Taxus canadensis

Canadian Yew

4 tlin 8 cyuc 3 kcaak 1 tcan 4 dwat 1.5 m hkuc pcmhmimhtut cyutli kyuctup hwicli hraslutnyik hpa7tii frusflatpriklwisslip hpa7tmwatli dwat hjonli

drutta Taxus canadensis is an evergreen Tree growing to 1.5 m (5ft) by 1.5 m (5ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, and the seeds ripen from September to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[43, 46, 61, 105]. Very sweet and gelatinous, most people find it delicious though some find it sickly[K]. The fruit is a fleshy berry about 8mm in diameter and containing a single seed[200]. All other parts of this plant, including the seed, are highly poisonous. When eating the fruit you should spit out the large seed found in the fruit's centre. Should you swallow the whole seed it will just pass straight through you without harm, if the seed has been bitten into, however, it could cause some problems.

tcanta DyeA green dye can be obtained from the leaves[257].

dwatta Abortifacient Analgesic Antirheumatic Cancer Diaphoretic Diuretic Emmenagogue FebrifugeThe Canadian yew is a very poisonous plant, though it was employed medicinally by several native North American Indian tribes who used minute amounts of the leaves both internally and externally in order to treat a variety of complaints including rheumatism, fevers, influenza, expelling afterbirth and dispelling clots[213, 222, 257]. Modern research has shown that it contains the substance 'taxol' in its shoots and bark. Taxol has shown exciting potential as an anti-cancer drug, particularly in the treatment of ovarian cancers[222, 238]. This remedy is very toxic and, even when used externally, should only be used under the supervision of a qualified practitioner[238]. See also the notes above on toxicity. The plant is abortifacient, analgesic, antirheumatic, antitumor, diaphoretic, diuretic, emmenagogue, febrifuge and pectoral[257].

propta Seed - can be very slow to germinate, often taking 2 or more years[78, 80]. It is best sown as soon as it is ripe in the autumn when it should germinate 18 months later. Stored seed may take 2 years or more to germinate. 4 months warm followed by 4 months cold stratification may help reduce the germination time[113]. Harvesting the seed 'green' (when fully developed but before it has dried on the plant) and then sowing it immediately has not been found to reduce the germination time because the inhibiting factors develop too early[80]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in pots in a cold frame. The seedlings are very slow-growing and will probably require at least 2 years of pot cultivation before being large enough to plant out. Any planting out is best done in late spring or early summer, after the last expected frosts[K]. Cuttings of half-ripe terminal shoots, 5 - 8cm long, July/August in a shaded frame. Should root by late September but leave them in the frame over winter and plant out in late spring[78]. High percentage[11]. Cuttings of ripe terminal shoots, taken in winter after a hard frost, in a shaded frame[113].

nwatta Thrives in almost any soil, acid or alkaline, as long as it is well-drained[200]. Plants are very shade tolerant[82]. This species is the most cold-hardy member of the genus[11] - dormant plants will tolerate very heavy frosts

though the young growth in spring can be damaged by a few degrees of frost. The plants produce very little fibrous root and should be planted in their final positions when still small[81]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Other reports say that this species usually has monoecious flowers (separate male and female flowers, but both borne on the same plant)[82, 270].

### 5.2.275 Asclepias rubra

Red Silkweed

4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli kyuctcup hwicli hraslutlp hpa7ti flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Asclepias rubra is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves SeedpodEdible Uses: Gum SweetenerFlower buds - cooked as potherbs or added to soups[207]. Young shoots and leaves - cooked as potherbs or added to soups[207]. Young seed pods, 3 - 4 cm long, cooked[207]. Flower clusters can be boiled down to make a sugary syrup[207]. A chewing gum can be made from the latex contained in the stem and leaves, but it is possibly toxic[207].

tcanta Fibre Gum Latex StuffingThe following reports refer to other members of this genus and are possibly also appropriate for this species[K]. A good quality fibre is obtained from the bark, used in making twine, cloth, paper etc[95, 112, 169]. It is of poor quality in wet seasons[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[112, 159, 169, 171]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[112]. Very water repellent, it can yield up to 20% of an edible semi-drying oil[74, 112]. It is also used in making liquid soap[74].

dwatta WartsThe latex is used as a cure for warts[168]. propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°c[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Prefers a well-drained light rich or peaty soil and a sunny position[1, 134, 200]. A very ornamental plant[1], it is closely related to A. lanceolata[200]. Many members

of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resist root disturbance and are best planted into their final positions whilst small[134]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

### 5.2.276 *Leymus racemosus*

Volga Wild Rye, Mammoth wildrye  
4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 1.2 m hkuc  
htut cyutli hgatyuctcup hwicli hysirasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta *Leymus racemosus* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Oil Seed StemEdible Uses: OilSeed - used as a cereal substitute in some parts of Russia, especially in times of drought[183]. The seed is rather small and difficult to extract[K]. Young underground shoots - raw. Sweet and tender[183].

tcanta Oil Soil stabilizationPlants have an extensive spreading root system and are used to stabilize inland sand dunes, though they do not tolerate salty conditions[61].

dwatta None known  
propta Seed - sow mid spring in situ and only just cover the seed[162]. Germination should take place within 2 weeks. If the supply of seed is limited, it can also be sown in mid spring in a cold frame. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in summer[K] Division in spring or summer[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils, preferring a sandy soil and a sunny position[1, 200]. Established plants are drought resistant[183]. Plants can be very invasive, spreading freely by means of the rhizomes. Currently (1990) being evaluated as a perennial grain crop in N. America[183]. There are some named varieties, selected for their ornamental value[200].

### 5.2.277 *Amelanchier humilis*

Low serviceberry  
4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta *Amelanchier humilis* is a deciduous Shrub growing to 1.8 m (6ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[105, 159, 177]. Sweet[43]. A very pleasant flavour, the fruit is juicy with a hint of apple in the taste and contains a few small seeds at the centre[K]. The fruit is rich in iron and copper[226].

tcanta None known  
dwatta None known  
propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can

be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Plants are often found growing on calcareous soils in the wild[43]. Hardy to about -25°C[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible oramentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. This species produces suckers freely, forming thickets[184]. Closely related to *A. stolonifera* [11, 200]. Hybridizes with *A. stolonifera*, *A. arborea* and *A. bartramiana*. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 5.2.278 *Chaenomeles x californica*

California Quince  
4 tlin 8 cyuc 3 kcaak 2 tcan 1 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Chaenomeles x californica* is a deciduous Shrub growing to 1.8 m (6ft) by 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Fruit - very harsh and acid raw but fragrant when cooked. Used for jams, jellies etc and as a flavouring with cooked apples[K]. The fruit can be apple or pear-shaped and up to 6cm long x 6cm wide[200]. The flesh is firm, fragrant and acidic.

tcanta Plants can be grown to make a medium sized hedge[200]. Attractive flowers. Landscape Uses: Border, Erosion control, Ground cover, Massing, Woodland garden. Some cultivars of *Chaenomeles x superba* such as 'Crimson and Gold' produce suckers prolifically and are suitable for ground cover[182]. This may not be present in the hybrid.

dwatta Possibly some medical uses. *C. x californica* is a tri-species hybrid (*C. x superba* x *C. cathayensis*). *Chaenomeles cathayensis* fruits is antiemetic, antirheumatic, antispasmodic and digestive[176]. It is used in the treatment of rheumatic pain, convulsions of the calf muscles, vomiting, dyspepsia and diarrhoea[176]. No medical uses are known for *Chaenomeles x superba*.

propta Seed - best sown as soon as it is ripe in a sheltered position outdoors or in a cold frame[200]. Sown stored seed in February in a greenhouse[78]. Germination usually takes place within 6 weeks[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle. If well grown, these seedling can be large enough to plant out in the summer, but give them some protection in their first winter. Otherwise plant them out in late spring of the following year[K]. This species is a hybrid and so will not breed true from seed. Cuttings of half-ripe wood, July/August in a frame[11]. Easy[113]. Cuttings of mature wood of the current year's growth, November in a cold frame. Layering in late spring or in autumn. This is a sure and easy method, though it takes 12 months[78, 200].

nwatta The hybrid *C. x californica* is a tri-species hybrid (*C. x superba* x *C. cathayensis*). Named cultivars are avail-

soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[5, 12, 16, 21]. A delicious spinach substitute in the spring, the leaves become less pleasant as the season progresses, developing a distinct bitterness in hot weather[K]. Some people dislike the raw leaves since they can leave an unpleasant taste in the mouth[K].

tcanta None known

dwatta Antitumor EmmenagogueAlthough little used in modern herbalism, beet has a long history of folk use, especially in the treatment of tumours[269]. A decoction prepared from the seed has been used as a remedy for tumours of the intestines. The seed, boiled in water, is said to cure genital tumours[269]. The juice or other parts of the plant is said to help in the treatment of tumours, leukaemia and other forms of cancer such as cancer of the breast, oesophagus, glands, head, intestines, leg, lip, lung, prostate, rectum, spleen, stomach, and uterus[269]. Some figure that betacyanin and anthocyanin are important in the exchange of substances of cancer cells; others note two main components of the amines, choline and its oxidation product betaine, whose absence produces tumours in mice[269]. The juice has been applied to ulcers[269]. A decoction is used as a purgative by those who suffer from haemorrhoids in South Africa[269]. Leaves and roots used as an emmenagogue[269]. Plant effective in the treatment of feline ascariasis[269]. In the old days, beet juice was recommended as a remedy for anaemia and yellow jaundice, and, put into the nostrils to purge the head, clear ringing ears, and alleviate toothache[269]. Beet juice in vinegar was said to rid the scalp of dandruff as scurf, and was recommended to prevent falling hair[269]. Juice of the white beet was said to clear obstructions of the liver and spleen[269]. Culpepper (1653) recommended it for treating headache and vertigo as well as all affections of the brain[269].

propta Seed - sow March to May in situ.

nwatta Beets grow well in a variety of soils, growing best in a deep, friable well-drained soil abundant with organic matter, but doing poorly on clay. They prefer an open position and a light well-drained soil[52]. The optimum pH is 6.0 - 6.8, but neutral and alkaline soils are tolerated in some areas. Some salinity may be tolerated after the seedling stage. Beets are notable for their tolerance to manganese toxicity. Beet is reported to tolerate an annual precipitation of 23 to 315cm, an average annual temperature range of 5.0 to 26.6°C and a pH of 4.2 to 8.2[269]. This is the wild beetroot of coastal areas. The cultivated beetroot, sugar beet, seakale beet and Swiss chard have all been developed from this species by means of selective breeding[1, 5]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.410 *Sorbus scopulina*

Western Mountain Ash, Greene's mountain ash, Cascade mountain ash

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 4 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Sorbus scopulina* is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw, cooked in pies, preserves etc, or dried for later use[62, 101, 183]. A bitter flavour[212]. The fruit becomes sweeter and so tastes best after a frost, it can also be blotted if it is going to be eaten raw[K]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this

stage the fruit of many species has a delicious taste, somewhat like a luscious tropical fruit. The fruit is up to 5mm across[200].

tcanta WoodThe wood is soft and weighs 37lb per cubic foot[25].

dwatta Enuresis Febrifuge TonicAn infusion of the branches has been given to young children with bed-wetting problems[257]. The bark is febrifuge and tonic[257]. It has been used in the treatment of general sickness[257].

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Dislikes dry soils[188]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188].

### 5.2.411 *Orchis mascula*

Early Purple Orchis  
4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwislip hpa7tmwatli xre7t hjonli

drutta *Orchis mascula* is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: DrinkRoot - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Antiflatulent Astringent Demulcent Expectorant NutritiveSalep (see above for more details) is very nutritive, astringent, expectorant and demulcent[4, 240]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed.

the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1].

## 5.2.407 Orchis militaris

Military Orchis

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli lwissliph hpa7tmwatli xre7t hjonli

drutta Orchis militaris is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: DrinkRoot - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Easily grown on a good loamy soil[42]. Requires a deep rich soil[1]. Prefers a chalky soil[42]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then

disappear, suggesting that they might be short-lived perennials[230]. Cultivated plants often survive for many years, though they rarely multiply[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1]. Plants seem to be immune to the predations of rabbits[233].

## 5.2.408 Lilium leichtlinii maximowiczii

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium leichtlinii maximowiczii is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[85, 105]. The bulb can be up to 4cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanum tuberosum).

tcanta None known

dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Requires a light humid-rich soil and plenty of moisture in late spring[47]. Should succeed in a cool well-drained peat, leaf-mould and sand mix with shelter from the midday sun[42]. Best grown in a greenhouse border in Britain[1]. This species could be one of the parents of *L. lancifolium*[90]. Stem rooting, the bulbs should be planted 15cm deep[42, 200]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. This form is said to be much easier to grow than the species[42], though this is not necessarily true[47] The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.409 Beta vulgaris maritima

Sea Beet

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwissliph-som hpa7tmwatli xre7t hjonli

drutta Beta vulgaris maritima is a ANNUAL/PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline)

able in the horticultural trade. *Chaenomeles x californica* is a strong growing quince with an upright crown reaching 1.8m high and wide. 'Enchantress' is a compact shrub single white to pink flowers and large yellow edible fruits. 'Masterpiece' has large ovate fruit and pink-red flowers. Easily cultivated in any reasonably good soil[1, 200]. Prefers a deep moist well-drained loam[4, 11]. Grows well in heavy clay soils. Tolerates full shade but requires a sunny position for best fruit production[3, 11, 200]. Becomes chlorotic on very alkaline soils[188, 200]. Tolerates atmospheric pollution[200]. A very ornamental plant[1], it is hardy to about -25c[200]. Plants are subject to canker, especially when growing in the milder moister areas of Britain[49]. Plants in this genus are notably resistant to honey fungus[200]. Fruits are usually freely produced in Britain, but they do not always ripen[11, 182]. A good bee plant, flowering early in the year and providing pollen and nectar[108]. Landscape Uses: Border, Erosion control, Ground cover, Massing, Woodland garden. Special Features: Not North American native, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.279 Lilium brownii

Hong Kong Lily

4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lilium brownii is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: ConditionBulb - cooked[61, 105, 163]. A pleasant slightly sweet taste[183]. They are used as a vegetable in much the same way as potatoes (Solanum tuberosum). A starch can be extracted from the bulbs and added to other foods[183]. The grated bulb can be added as a thickener to soups etc[183]. The bulb is usually rather small[260] - it is 25 - 40mm in diameter[266]. The dried flower petals are used as a flavouring in soups[183].

tcanta None known

dwatta Antitussive Carminative Diuretic Expectorant Febrifuge Pectoral Poultice Sedative TonicThe bulb is antitussive, diuretic, carminative, expectorant, febrifuge, pectoral, sedative and tonic[147, 176, 218]. A decoction is used in the treatment of coughs and haematemesis due to deficiency condition, anxiety, apprehension, oedema and difficult urination[147]. Bulbils from the leaf axils are used in the treatment of intestinal disorders[218]. The dried and powdered flowers are used as a poultice for bruises, cuts etc[218].

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. Bulblets are formed on the stem just below the soil surface. These should be dug up in the autumn and replanted immediately, preferably in a cold frame for growing on until large enough to plant out into the garden[143, 163].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Requires a light soil[42, 47]. Is this species lime-tolerant?[200]. Plants prefer a position that is moist in the summer but dry in the winter[260]. Stem rooting, the bulbs should be planted 20 - 25cm deep[42, 47, 143]. Said to be very difficult in cultivation[47], this species tolerates temperatures down to about -3°C[260]. It grows well at Kew but is not hardy everywhere[143]. Self-sterile, the type species does not set seed[47]. It is believed that this species is either of hybrid origin or it is a garden form of the true wild species *L. brownii colchesteri*. Wils.[143]. It is the sub-species *colchesteri* that is used medicinally[176, 218]. The flowers have a soft sweet fragrance. This fragrance is more pronounced in the variety 'Viridulum'[245]. The plant does not come into growth until late spring[260]. It should be protected against slugs at this time since if the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. The edible bulbs are occasionally sold in ethnic markets in San Francisco[183] and are a common food item in China[179], where the plant is cultivated for edible and medicinal use[266]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

## 5.2.280 Viola epipsila

Dwarf Marsh Violet

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Viola epipsila is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Young leaves and flower buds - raw or cooked[172]. When added to soup they thicken it in much the same way as okra[85, 159]. Flowers - raw[172]. A tea can be made from the leaves[85].

tcanta The dried root has been used as an incense[257].

dwatta None known

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159].

## 5.2.281 Thymus praecox arcticus

Wild Thyme

4 tlin 8 cyuc 3 kcaak 5 tcan 2 dwat 0.1 m hkuc htut cyutli hgatkyuctcup hwicli hrasljut hpa7tli prikkwissliph hpa7tmwatli xre7t hjonli

drutta Thymus praecox arcticus is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium

(loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**ckakta Edible Parts:** Leaves**Edible Uses:** Condiment TeaLeaves - raw in salads or added as a flavouring to cooked foods[183]. Retains its flavour well in long slow cooking. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200]. An aromatic tea is made from the leaves or dried flowers[183].

**tcanta Deodorant Disinfectant Essential Fungicide Repellent**An essential oil from the leaves is used in perfume, soaps, medicinally etc[200]. It has fungicidal properties[171]. The dried flowers are used to repel moths from clothing[4].

**dwatta Anthelmintic Antiseptic Antispasmodic Carminative Deodorant Diaphoretic Disinfectant Expectorant Sedative Tonic**The leaves, and especially the essential oil contained in them, are anthelmintic, antiseptic, antispasmodic, carminative, deodorant, diaphoretic, disinfectant, expectorant, sedative and tonic[4, 7, 21, 200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

**propta Seed** - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

**nwatta** Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils, tolerating drought once it is established[190]. Grows well between stepping stones on paths, tolerating light treading[183, 200]. Succeeds on walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Hardy to about -15°C[200]. Closely related to *T. serpyllum*[11], this plant is the true native wild thyme in Britain[11]. It is a very polymorphic plant, there are a number of named forms[183]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[1]. A good companion for most other plants[54], it makes a very good carpeting plant for the rockery or between paving stones[1]. The flowers are rich in nectar and are very attractive to honey bees[200].

## 5.2.282 *Aegopodium podagraria*

Ground Elder, Bishop's goutweed, Goutweed, Ground Elder, Bishop's Weed

4 tlin 9 cyuc 3 kcak 1 tcan 2 dwat 0.6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklkwiss hpa7tmwatli fyifxre7t hjonli

**drutta** *Aegopodium podagraria* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Leaves**Edible Uses:** Leaves - raw or cooked[2, 4, 5, 12, 54, 100]. An unusual tangy flavour[183], the majority of people we give it to do not like it[K] although some reports say that it makes a delicious vegetable[244]. The leaves are best harvested before the plant comes into

flower, they can be used in salads, soups, or cooked as a vegetable[9].

**tcanta** This species makes a good ground-cover for semi-wild situations[200]. Make sure that it has plenty of room since it can be very invasive and is considered to be a weed in many gardens[208].

**dwatta** Antirheumatic Diuretic Sedative Vulnerary-Ground Elder has a long history of medicinal use and was cultivated as a food crop and medicinal herb in the Middle Ages. The plant was used mainly as a food that could counteract gout, one of the effects of the rich foods eaten by monks, bishops etc at this time. The plant is little used in modern herbalism. All parts of the plant are antirheumatic, diuretic, sedative and vulnerary[9, 13, 53, 54, 61]. An infusion is used in the treatment of rheumatism, arthritis and disorders of the bladder and intestines[9]. Externally, it is used as a poultice on burns, stings, wounds, painful joints etc[9, 268]. The plant is harvested when it is in flower in late spring to mid-summer and can be used fresh or be dried for later use[9, 238]. A homeopathic remedy is made from the flowering plant[9]. It is used in the treatment of arthritis and rheumatism[9].

**propta Seed** - sow spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Very easy, divisions can be carried out at almost any time of the year and the divisions can be planted out straight into their permanent positions.

**nwatta** Landscape Uses:Border, Container, Foundation, Ground cover, Woodland garden. Prefers damp shady conditions[12, 13, 200] but succeeds in most soils[200]. Prefers a well-drained soil, succeeding in sun or shade[238]. Plants are hardy to at least -15°C[200]. This species was cultivated in the Middle Ages as a medicinal and food plant[5, 17, 177, 268]. A very invasive plant, spreading freely at the roots[4, 53, 208], though it seldom sets seed in Britain[208]. Once established it can be very difficult to eradicate because any small piece of root left in the ground can regrow[K]. If introducing this plant to your garden, it might be best to restrict the roots by growing the plant in a bottomless container buried in the soil[238]. There is a variegated form of this species that is less invasive and is sometimes grown in the ornamental garden[208]. Plants seem to be immune to the predations of rabbits[233]. **Special Features:** Attractive foliage, Not North American native, Invasive, Naturalizing, Wetlands plant. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 5.2.283 *Chenopodium capitatum*

Strawberry Blite, Blite goosefoot

4 tlin 8 cyuc 3 kcak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklkwiss hpa7tmwatli xre7t hjonli

**drutta** *Chenopodium capitatum* is an ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**ckakta Edible Parts:** Fruit Leaves Seed**Edible Uses:** ColouringLeaves - raw or cooked[27, 106]. Used like spinach[2], they are a good source of vitamins C and A[257]. The young leaves are best[85, 172, 183]. Poor quality[74]. The raw leaves have been used in salad mixtures[257], but should only be eaten in small quantities, see the notes above on toxicity. Fruit - raw or cooked[2, 27, 172]. An insipid but sweet flavour[85], they can be added to salads[183]. The fruit is about 12mm in diameter[200]. A red food colouring can be obtained from the fruit[74, 99, 172, 183]. Seed - cooked. It can be ground into a meal and mixed with cereal flours in making bread etc[161, 172]. The seed is small and fiddly, it should be soaked in water overnight and thoroughly rinsed before it is used in order to remove any saponins.

undercut the roots if they are to be left undisturbed for more than two years.

**nwatta** Landscape Uses:Border, Espalier, Pollard, Screen, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -18°C[202]. This species is closely related to *C. crus-galli*[11]. It hybridizes freely with other members of the genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. **Special Features:**Attracts birds, North American native, Blooms are very showy.

## 5.2.405 *Malus kansuensis*

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprklkwiss hpa7tmwatli xre7t hjonli

**drutta** *Malus kansuensis* is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[105, 177]. A very acid flavour even when fully ripe[K]. We have seen fruit that has bletted whilst still on the tree - at this stage the flesh has become very soft and mealy but still has a very acid flavour[K]. The fruit can be up to 1cm in diameter[200].

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

**nwatta** An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[200]. This species is closely related to *M. toringoides*[11]. It hybridizes freely with other members of the genus[200]. The fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.406 *Orchis morio*

Green-Winged Orchid, Green-winged orchid

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat m hkuc  
htut cyutli kyuctup hwicli hrasljutnyik hpa7tli flatprklkwisslip hpa7tmwatli xre7t hjonli

**drutta** *Orchis morio* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and

is not frost tender. It is in leaf from April to August, in flower from May to June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

**ckakta Edible Parts:** Root**Edible Uses:** DrinkRoot - cooked[2, 4, 46]. This species is a major source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

**tcanta** None known

**dwatta** Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

**propta Seed** - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

**nwatta** Prefers a sunny position and a good loamy soil[42]. Requires a deep rich soil[1]. Grows well in a sunny dry border or on a scree[200]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants seem to be immune to the predations of rabbits[233]. The flowers have a powerful scent that is not particularly pleasant[245]. Those forms with lighter coloured flowers have a more pleasant scent[245]. Cultivated plants are very susceptible to the predation of slugs and snails[230]. Plants can occasionally appear in lawns where they will increase freely if allowed to set seed[230]. The lawn should not be mown early in the year before or immediately after flowering[200]. If you want to try establishing plants in a lawn then plant out the bulbs whilst the plant is dormant, preferably in

plants[197, 200]. The sub-species *L. japonica repens* is especially used for this purpose on the continent[182]. The cultivar 'Halliana' has also been recommended[188, 197]. This cultivar should be clipped back severely in the spring if it gets untidy, it responds well to such conditions[208]. Plants should be spaced about 1 metre apart each way[208]. The plant is said to be insectidal[218]. The stems have been used in making baskets[257].

**dwatta** Antibacterial Antiinflammatory Antispasmodic Antiviral Depurative Diuretic Dysentery Febrifuge Skin TB VDThe stems and flower buds are alterative, antibacterial, anti-inflammatory, antispasmodic, depurative, diuretic, febrifuge[147, 174, 176, 178, 238]. The plant is also used to reduce blood pressure[174, 176, 238]. The stems are used internally in the treatment of acute rheumatoid arthritis, mumps and hepatitis[238]. The stems are harvested in the autumn and winter, and are dried for later use[238]. The stems and flowers are used together as an infusion in the treatment of upper respiratory tract infections (including pneumonia) and dysentery[238]. An infusion of the flower buds is used in the treatment of a wide range of ailments including syphilitic skin diseases and tumours, bacterial dysentery, colds, enteritis, pain, swellings etc[174, 176, 218, 222, 238, 279]. Experimentally, the flower extracts have been shown to lower blood cholesterol levels and are antibacterial, antiviral and tuberculostatic[222, 279]. Externally, the flowers are applied as a wash to skin inflammations, infectious rashes and sores[238]. The flowers are harvested in early morning before they open and are dried for later use[238]. The plant has a similar action to *Forsythia suspensa* and is usually used in combination with that species to achieve a stronger action[176]. This plant has become a serious weed in many areas of N. America, it might have the potential to be utilized for proven medical purposes[222].

**propta Seed** - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

**nwatta** Prefers a good moist soil with its roots in the shade and its top climbing into the light[200]. Succeeds in any soil in part shade[184]. Established plants are drought tolerant[190]. They succeed in dry shade, the cultivar 'Halliana' is especially recommended for such a situation[188]. Plants are hardy to about -20°C[184]. The foliage can be damaged in severe wind-chill conditions but the plant usually recovers in the spring[202]. Fruit is only formed after a hot summer[202]. A rampantly growing plant[190], it climbs by twining around other plants[182] and makes an excellent screen for a north or east facing fence or an unsightly object[190]. This species has the potential to become a rampant weed, it has escaped from cultivation in N. America where it can outcompete native species[274]. The plant has powerfully scented flowers. The white-flowered cultivar 'Halliana' has a pronounced lemon-like perfume[245]. There are several named varieties, developed for their ornamental value[182, 200]. Special Features:Not North American native, Invasive, Naturalizing, Fragrant flowers, Attractive flowers or blooms.

## 5.2.403 Berchemia flavescens

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Berchemia flavescens* is a deciduous Climber growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: FruitEdible Uses: Fruit - eaten raw when fully ripe[272]. The sausage-shaped fruit is about 12mm long[11].

**tcanta** None known  
**dwatta** None known  
**propta** Seed - sow spring or autumn in a cold frame[200].

When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[200]. Cuttings of mature wood of the current season's growth, November to January in a frame. Root cuttings in winter[200]. Layering of young stems in winter[200].

**nwatta** Requires a good moist well-drained loam, succeeding in full sun if the soil does not dry out otherwise it is best in light shade[11, 200]. Suitable for growing along fences, against walls with wire supports or for growing through other shrubs[200]. Plants climb by means of twining around supports[182]. Flowers are produced on the current years growth[200]. It takes almost 12 months from flowering to ripening the fruit[266].

## 5.2.404 Crataegus canbyi

Cockspur hawthorn, Dwarf Hawthorn, Cockspur Hawthorn 4 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 5 m hkuc hmimhtut cyutli hgatkyuctcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Crataegus canbyi* is a deciduous Shrub growing to 5 m (16ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midgees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcakta** Edible Parts: FruitEdible Uses: Fruit - raw or cooked[82]. The fruit is about 12mm in diameter and is borne in small clusters[200]. It has a thick, bright red, juicy flesh[82]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta** Wood - fine-grained, tough, hard and heavy. Used for tool handles etc[82].

**dwatta** Cardiac HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

**propta** Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but

**tcanta** DyeGold/green dyes can be obtained from the whole plant[168]. A red dye is obtained from the fruit, it is used in cosmetics and as a paint[46, 257].

**dwatta** Antiphlogistic PectoralThe plant has been used as a lotion for treating black eyes and head bruises[257]. The juice of the seeds and an infusion of the plant has been used to treat lung congestion[257].

**propta** Seed - sow spring in situ. Most of the seed usually germinates within a few days of sowing.

**nwatta** An easily grown plant, succeeding in most soils but disliking shade[1, 200]. It prefers a moderately fertile soil[200]. A very ornamental plant[74], strawberry blite has at times been cultivated for its edible leaves[61].

## 5.2.284 Allium angulosum

Mouse Garlic 4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Allium angulosum* is an evergreen Bulb growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[105]. It can be preserved for winter use by salting[2, 177]. The small bulbs are slender and elongated[203] and about 5mm wide[200]. Leaves - raw or cooked. There is a slight bitterness in the flavour[K]. Flowers - raw. Used as a garnish on salads.

**tcanta** RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

**dwatta** Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

**propta** Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

**nwatta** An easily grown plant[203], it prefers a sunny position in a moist but well-drained soil[203]. Succeeds in heavy soils and in light shade[203]. The bulbs should be planted fairly deeply[1]. This species is often sold in nurseries as *A. pyrenaicum*[203]. Closely related to *A. senescens*, differing mainly in having keeled leaves[203]. The flowers do not have the usual onion smell[203]. Cultivated as a vegetable in Siberia[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.285 Primula veris

Cowslip, Cowslip primrose 4 tlin 8 cyuc 3 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Primula veris* is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August.

The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Flowers LeavesEdible Uses: TeaY-oung leaves - raw or cooked in soups etc[4, 7, 115, 148, 183]. They are not that tasty, but are available in late winter which adds somewhat to their value[K]. The fresh or dried leaves are used as a tea substitute[177, 183]. Flowers - raw, cooked or used in conserves, as a garnish etc[4, 183]. They make an ornamental addition to the salad bowl[238, K]. This species has become much less common in the past 100 years due to habitat destruction, over-collecting from the wild and farming practices. When it was more abundant, the flowers were harvested in quantity in the spring and used to make a tasty wine with sedative and nervine properties[238]. A related species *Primula elatior* is listed by the Council of Europe as a natural food flavouring [301].

**tcanta** None known

**dwatta** Anodyne Antianxiety Antiechymotic Antiinflammatory Antispasmodic Diaphoretic Diuretic Expectorant Sedative SternutatoryCowslips are an underused but valuable medicinal herb. They have a very long history of medicinal use and have been particularly employed in treating conditions involving spasms, cramps, paralysis and rheumatic pains[238]. The plant contains saponins, which have an expectorant effect, and salicylates which are the main ingredient of aspirin and have anodyne, anti-inflammatory and febrifuge effects[238]. This remedy should not be prescribed for pregnant women, patients who are sensitive to aspirin, or those taking anti-coagulant drugs such as warfarin[238]. The flowers and the leaves are anodyne, diaphoretic, diuretic and expectorant[7, 9, 21, 165]. They are harvested in the spring and can be used fresh or dried[238]. The yellow corolla of the flower is antispasmodic and sedative[4]. They are recommended for treating over-activity and sleeplessness, especially in children[254]. They are potentially valuable in the treatment of asthma and other allergic conditions[254]. At one time an oil was produced by maceration of the flowers, this has an antiechymotic effect (treats bruising)[7]. The root contains 5 - 10% triterpenoid saponins which are strongly expectorant, stimulating a more liquid mucus and so easing the clearance of phlegm [254]. It has been dried and made into a powder then used as a sternutatory[7]. The root is also mildly diuretic, antirheumatic and slows the clotting of blood[9, 254]. It is used in the treatment of chronic coughs (especially those associated with chronic bronchitis and catarrhal congestion), flu and other febrile conditions[9]. The root can be harvested in the spring or autumn and is dried for later use[9]. The leaves have similar medicinal properties to the roots but are weaker in action[254]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of kidney complaints and catarrh[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Primula veris* for cough/bronchitis (see [302] for critics of commission E).

**propta** Seed - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. Germination is inhibited by temperatures above 20°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in autumn. This is best done every other year[200].

**nwatta** Prefers a medium to heavy moisture retentive humus rich loam in a cool position with light to medium shade[200]. Grows well in heavy clay soils and on chalk[187]. Prefers full sun and a well-drained alkaline soil if it is to survive well[187, 238]. Plants are hardy to about -20°C[187]. A very ornamental plant[1], it grows well in the spring meadow[24]. The flowers diffuse a sweet fragrance quite unlike all other flower scents. It has been likened by some to the breath of a cow (sculippe is the Saxon word for this and thus the origin of the common name), by others to the sweet milky breath of a tiny child[245].

## 5.2.286 *Tragopogon porrifolius*

Salsify

4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Tragopogon porrifolius* is a BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Root Seed StemEdible Uses: GumRoot - raw or cooked[2, 5, 27, 33, 37, 89]. The young root can be grated in salads[12], older roots are best cooked[183]. The flavour is mild and sweet, and is said to resemble oysters[183, K]. The roots are harvested as required from October until early spring, or can be harvested in late autumn and stored until required[4]. Young shoots - raw or cooked[2, 12, 27, 33, 37, 52, 183]. The new growth is used in spring. A sweet taste[200]. Flowering shoots - raw or cooked[200]. Used like asparagus. Flowers - raw. Added to salads[183]. The sprouted seeds can be added to salads or sandwiches[183]. The root latex is used as a chewing gum[61, 105, 161, 183].

tcanta GumNone known

dwatta Antibilious Aperient Deobstruent DiureticSalsify is a cleansing food with a beneficial effect upon the liver and gallbladder[254]. The root is antibilious, slightly aperient, deobstruent and diuretic[4, 21]. It is specific in the treatment of obstructions of the gall bladder and jaundice[240] and is also used in the treatment of arteriosclerosis and high blood pressure[254].

propta Seed - sow in situ as early in the year as possible, in March if weather conditions permit[4]. Seed sowings often fail unless the soil is kept moist until the seedlings are growing well[4].

nwatta Succeeds in ordinary garden soils, including heavy clays[4, 200]. Plants do not grow well in stony soils[4]. Prefers an open situation[37] and a cool moist root run[14, 20]. Salsify is occasionally cultivated in the garden for its edible root[2, 89], there are some named varieties[183]. Grows well with mustard[20].

## 5.2.287 *Mitchella repens*

Partridge Berry

4 tlin 9 cyuc 3 kcaak 4 tcan 3 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta *Mitchella repens* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw[2, 105, 161]. Pleasant and slightly aromatic[183]. Dry and tasteless, with lots of seeds according to another report[4]. The fruit hangs on well on the bush[1]. The fruit is about 8mm in diameter[200]. A tea is made from the leaves[207].

tcanta Can be used as a ground cover plant in a shady position[3, 188]. Plants form a spreading carpet, rooting along the stems, and are best spaced about 30cm apart each way[208].

dwatta Astringent Diuretic Hypnotic Oxytoxic Sedative Tonic Women's complaintsPartridge berry was commonly used by several native North American Indian tribes as a parturient to hasten childbirth. It was also occasionally used to treat a variety of other complaints including insomnia, rheumatic pain and fluid retention[254]. It is still used in modern herbalism as an aid to childbirth and is also considered to have a tonic effect upon the uterus and the

ovaries[254]. The herb is astringent, diuretic, hypnotic and tonic[4, 21, 102, 165, 192, 213]. Frequent doses of a tea made from the fresh or dried leaves were used by N. American Indian women in the weeks preceding childbirth in order to promote easy delivery[213, 222, 238]. This tea should not be used during the first six months of labour, however, since it can induce a miscarriage[238]. The tea is also used to treat delayed, painful or irregular menses[222, 238]. The tea was also used externally as a wash for hives, swellings, sore nipples, rheumatism etc[222]. The leaves are harvested in the summer and dried for later use[238]. A tea made from the berries has a very definite sedating effect on the nervous system[192].

propta Seed - it germinates better if given 3 months cold stratification and so it is best sown as soon as it is ripe in the autumn[113]. Sow stored seed as early in the year as possible. Make sure that all the fruit pulp is removed from the seed because it contains germination inhibitors[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of naturally layered stems in the spring[200]. Cuttings.

nwatta Landscape Uses:Container, Ground cover, Rock garden, Specimen, Woodland garden. Requires a moist but well-drained lime-free soil and some shade[11]. Prefers a peaty soil[1, 200], succeeding in neutral to acid soils[200]. Plants are hardy to at least -20°C[200]. A trailing plant, the stems forming new roots at the nodes[192]. The dried leaves have a scent of newly mown hay[245]. The flowers have a pleasant sweet fragrance[245]. Succeeds in the shade of trees[1, 11], growing well in a woodland and in the rock garden[1, 200]. Plants can be difficult to establish[188], though they can become invasive once they are well established[238]. Special Features:Attracts birds, Attractive foliage, North American native, Naturalizing, Fragrant flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.288 *Mahonia repens*

Creeping Oregon Grape, Creeping barberry, Grape Oregon  
4 tlin 8 cyuc 3 kcaak 4 tcan 3 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Mahonia repens* is an evergreen Shrub growing to 0.3 m (1ft) by 2 m (6ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit - raw or cooked[85, 183]. An acid flavour but it is rather nice raw, especially when added to muesli or porridge[85]. Unfortunately, there is relatively little flesh and a lot of seeds[1K]. Used for making jams, jellies etc. They can also be made into a refreshing lemonade-like beverage[183]. When sugar is added, the fruit juice is similar to grape juice[212]. The fruit is about 9mm in diameter[200].

## 5.2.399 *Smilax glauca*

Cat Greenbrier

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 5 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta *Smilax glauca* is an evergreen Climber growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[161, 257]. It can be boiled and made into a jelly or dried and ground into a powder then used with cereals when making bread etc[61, 105, 159]. Young shoots in spring - raw or cooked[159].

tcanta None known

dwatta Birthing aid Poultice RubefacientThe stem prickles have been rubbed on the skin as a counter-irritant to relieve localised pains, muscle cramps and twitching[222]. A tea made from the leaves and stems has been used in the treatment of rheumatism and stomach problems[222]. The wilted leaves are applied as a poultice to boils[222, 257]. A tea made from the roots is used to help the expelling of afterbirth[222]. Reports that the roots contain the hormone testosterone have not been confirmed, they might contain steroid precursors, however[222].

propta Seed - sow March in a warm greenhouse[1]. This note probably refers to the tropical members of the genus, seeds of plants from cooler areas seem to require a period of cold stratification, some species taking 2 or more years to germinate[K]. We sow the seed of temperate species in a cold frame as soon as we receive it, and would sow the seed as soon as it is ripe if we could obtain it then[K]. When the seedlings eventually germinate, prick them out into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first year, though we normally grow them on in pots for 2 years. Plant them out into their permanent positions in early summer. Division in early spring as new growth begins[238]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings of half-ripe shoots, July in a frame[238].

nwatta Succeeds in most soils in sun or semi-shade[200]. Hardy to at least -20°C[200]. A vigorous plant, it can be grown through trees or shrubs or over tree stumps[200]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.400 *Malus glaucescens*

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Malus glaucescens* is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Aromatic, it is 3 - 4cm in diameter[200]. tcanta The wood weighs 44lb per cubic foot[235]. dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large

enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. This species is closely related to *M. glabrata*[200]. It hybridizes freely with other members of the genus[200]. Plants in this genus are notably susceptible to honey fungus[20].

## 5.2.401 *Calystegia hederacea*

Japanese false bindweed

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Calystegia hederacea* is a PERENNIAL CLIMBER growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[105, 177], then washed and steamed. Considered to be very nutritious, it is rich in starch and sugar but it should not be eaten regularly[179]. Young shoots - cooked[105, 177].

tcanta None known

dwatta DiureticThe seed is simmered in water as a diuretic to stimulate kidney secretions[218].

propta Seed - sow spring in a cold frame in a free draining compost and only just cover. The seed usually germinates in 1 - 3 months at 15°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring whilst dormant[200].

nwatta Easily grown in ordinary garden soil in a sunny position, but plants are apt to become invasive[1, 200]. Nearly all taxa in *Calystegia* intergrade geographically into neighboring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically[266].

## 5.2.402 *Lonicera japonica*

Japanese Honeysuckle

4 tlin 10 cyuc 2 kcaak 0 tcan 3 dwat 5 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Lonicera japonica* is an evergreen Climber growing to 5 m (16ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Moths. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaLeaves - cooked. The parboiled leaves are used as a vegetable[183]. Some caution is advised, see notes above on toxicity. Flowers - sucked for their sweet nectar[183], used as a vegetable or made into a syrup and puddings[183]. A tea is made from the leaves, buds and flowers[177, 183].

tcanta Basketry InsecticideA very vigorous climbing plant, it makes a good dense ground cover plant where it has the space to run over the ground but it will swamp smaller



position but succeeds in partial shade, though it fruits less well in such a situation[200]. Plants usually produce seed apomictically (a method that does not involve sexual fusion, so the seedlings are clones of the parent) and therefore they breed true to type[11, 200]. A very ornamental plant[1]. The flowers are sweetly scented[245]. The fruit is a good wildlife food source, especially for birds. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 5.2.396 Malus lancifolia

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Malus lancifolia* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Up to 3cm in diameter[200].

tcanta The wood weighs 43lb per cubic foot.

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. There is some confusion over the correct name of this species. [43] gives the name as a synonym of *M. coronaria lancifolia* (along with *M. bracteata* for which we also have a record) whilst [200] recognizes it as a separate species. In [82] it is treated as part of *M. coronaria*. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.397 Ampelopsis humulifolia

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli jlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Ampelopsis humulifolia* is a deciduous Climber growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitLeavesEdible Uses: Fruit[177]. The fruit is about 4 - 5mm in diameter[200] and is carried in small bunches like grapes[K]. Leaves[177]. No more details.

tcanta None known

dwatta None known

propta Seed - sow in pots in a cold frame in the autumn or stratify for 6 weeks at 5°C and sow in the spring[200]. Germination can be quite slow, sometimes taking more than a

year. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. When they are more than 20cm tall, they can be planted out into their permanent positions, preferably in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long, July/August in a frame[78]. Cuttings or eyes in late autumn or winter. Either place them in the ground in a greenhouse or cold frame, or put them in pots. An eye cutting is where you have just one bud at the top and a short length of stem with a small part of the bark removed. These normally root well and grow away vigorously, being ready to plant into their permanent positions the following autumn. Layering into pots in late summer. Partially sever the stem in spring and then lift the new plants in the autumn[78].

nwatta Prefers a deep rich loam in a warm sheltered position in sun or semi-shade[11, 200]. Dormant plants are hardy to at least -25°C if the wood is fully ripened[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A very ornamental plant[1], it is closely related to *A. bodinieri*[11]. Plants rarely produce fruits in Britain unless there is a long hot summer[200]. Plants climb by means of coiling tendrils but large plants often need tying in to support the weight of foliage[200].

## 5.2.398 Humulus japonicus

Japanese Hop

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Humulus japonicus* is a PERENNIAL CLIMBER growing to 6 m (19ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: OilYoung leaves and young shoots - cooked[105, 177, 179]. Use before the end of May.

tcanta OilThe seed oil is used to make soap[266].

dwatta Diuretic Tonic UrinaryThe whole plant is diuretic and a genito-urinary tonic[178, 266].

propta Seed - sow spring in a cold frame[37]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring as new growth begins[1]. Take the divisions when the new shoots are about 10cm above ground level. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in March. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Easily grown in a good garden soil in sun or semi-shade[1, 200]. Prefers a deep rich loam[1]. A fast growing plant, with annual stems of up to 10 metres long being produced[219]. Plants rarely survive the winter outdoors in Britain, so are best grown as annuals[219]. This report needs confirmation since the plant is also reported as being hardy in zone 5 which would mean that it should succeed outdoors virtually anywhere in Britain[K]. A climbing plant, supporting itself by twining around the branches of other plants[219]. The bruised leaves are refreshingly aromatic whilst the flowers cast a pleasing scent[245]. Dioecious. Male and female plants must be grown if seed is required.

tcanta Dye Oil Soil stabilizationA yellow dye is obtained from the inner bark of the stem and roots[155, 257]. It is green[168]. Dark green, violet and dark blue-purple dyes are obtained from the fruit[168]. A green dye is obtained from the leaves[168]. Plants form suckers freely, making a good dense ground cover[11, 200], though they can be slow to become established[197] and will need weeding for their first few years after planting out[K]. The sub-species *M. repens rotundifolia* has been especially recommended[197]. A useful plant for preventing soil erosion on slopes[155].

dwatta Alterative Anaphrodisiac Antibacterial Antiseptic Antitumor Cholagogue Depurative Diuretic Dysentery Expectorant Febrifuge Laxative Salve TonicThe root and root bark is alterative, anaphrodisiac, antiseptic, cholagogue, depurative, diuretic, expectorant, febrifuge, laxative and tonic[4, 238]. It improves the digestion and absorption and is taken internally in the treatment of coughs, fevers, psoriasis, syphilis, haemorrhages, stomach complaints, kidney problems and impure blood conditions[4, 238, 257]. Externally, it is used as an antiseptic and healing wash or poultice on wounds and rheumatic joints[257]. The roots are harvested in late autumn or early spring and dried for later use[238]. A poultice of the fresh berries has been applied to boils[257]. Berberine, universally present in rhizomes of *Mahonia* species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta Landscape Uses:Border, Erosion control, Ground cover, Massing. An easily grown plant, it thrives in any good garden soil[11], preferring one on the dryish side. Grows well in heavy clay soils. Succeeds in the light shade of trees[K]. This species is hardy to about -15°C if growing in a sheltered position[184]. Established plants sucker freely and form quite dense thickets[200]. The flowers are scented[245]. Resistant to honey fungus[88]. Special Features: North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.289 Hydrophyllum canadense

John's Cabbage, Bluntleaf waterleaf

4 tlin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Hydrophyllum canadense* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[105, 177, 183]. A delicate potherb[183]. Only use when young, the leaves become bitter with age[159]. Root - cooked[2]. Only eaten in times of scarcity[161].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. The seed usually germinates in early spring. Sow stored seed as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a moist humus-rich soil in semi-shade[200]. Plants are growing well at Kew[K]. Slugs are particularly fond of this plant and will soon destroy it if given a chance[K].

## 5.2.290 Blephilia ciliata

Downy wood mint

4 tlin 7 cyuc 3 kcaak 2 tcan 1 dwat 0.7 m hkuc hmimhtut cyutli hgatykcuctup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli hjonli

drutta *Blephilia ciliata* is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves. Minty leaves eaten raw and used in teas. The leaves can be used to prepare sauces and drinks [1-4].

tcanta Soil stabilizationA strong scented plant that may act as an aromatic pest confuser reducing their ability to find other nearby crops [1-3]. The flowers attract long-tongued and short-tongued bees, bee flies, Syrphid flies, butterflies, and skippers (illinoiswildflowers.info). A plant for Forest Gardens, Pollinator Gardens, Prairie or Meadow. Used as Butterfly Nectar Plants or as part of a Groundcover or Mass Planting. Showy Blooms can be used in Cottage Gardens, Deer Resistant Plantings, Rock Gardens, Water-wise Landscapes, Low Maintenance Plantings, Perennial Borders, Restoration Projects and Wildlife Gardens (newmoonrursery.com).

dwatta Traditionally used by the Cherokee to make a poultice to treat headaches.

propta Propagate by division.

nwatta A Short-Lived fast-growing herbaceous perennial with an upright form. It prefers full sun to semi-shade and a loamy, silty soil with a pH 6 to 8. Downy wood mint has some drought tolerance but dislikes waterlogged soils or flooding. It is sensitive to salt, soil compaction. Flowers are fragrant. Soil can contain loam, clay, gravel and limestone. A high pH is tolerated but will restrict growth. It has a greater tolerance to drought than other mint species. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Root type is fibrous and shallow. Flowering time: June to August (Northern Hemisphere).

## 5.2.291 Wyethia amplexicaulis

Mulesears Wyethia, Mule-ears

4 tin 8 cyuc 3 kcak 0 tcan 1 dwat 0.8 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Wyethia amplexicaulis is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: Root - cooked[46, 61, 105, 161, 257]. The native North American Indians dug pits in the ground which they lined with large stones. They then burnt a fire on top of the stones until the stones were hot. The roots were placed on these hot stones, sealed in with fern leaves and earth and then fermented for one or two days[94]. Seed[161, 177, 207, 257]. No more details are given. Young shoots[177]. No more details are given.

tcanta None known dwatta PoultryThe roots furnish a remedy applied externally as a poultice to bruised and swollen limbs[207, 257].

propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse or cold frame in early spring. Use a very freely-draining compost, prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are large enough. Careful division of the crown as the plants come into growth in spring[200].

nwatta Requires a free-draining, gritty but moisture-retentive soil in a sunny position[200]. Plants are intolerant of drought[200]. Plants are considered to be a pest of grazing ground in N. America and large-scale eradication programmes are carried out[212].

## 5.2.292 Cardamine hirsuta

Hairy Bittercress

4 tin 8 cyuc 3 kcak 1 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hyhshrasljutnyik hpa7tli flatprklwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine hirsuta is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves and flowers - raw or cooked[2, 5, 52, 53, 105]. A hot cress-like flavour, they are mainly used as a garnish or flavouring in salads etc[132] but are also sometimes used as a potherb[183]. The plant germinates most freely in the autumn and so leaves are usually available all winter[244].

tcanta The tiny flowers are attractive to a few early butterflies, including (in the United States) spring azure (Celastrina ladon) and falcate orange-tip (Anthocharis midsea).

dwatta None known

propta Seed - sow spring or autumn in situ. This species needs very little encouragement and is quite capable of sowing itself, often too freely.

nwatta Prefers a moist humus rich soil in shade or semi-shade[200] but it succeeds in most soils and positions[1]. A common garden weed, it can be in flower all year round if the weather is mild. It will usually self-sow very freely in cultivated soil and is found especially in pot-grown plants[K].

## 5.2.293 Claytonia lanceolata

Lanceleaf Spring Beauty, Idaho springbeauty, Pacific springbeauty, Peirson's springbeauty

4 tin 8 cyuc 3 kcak 0 tcan 0 dwat 0.2 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Claytonia lanceolata is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in March, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[61, 105, 161, 257]. Rather palatable[60]. The raw root has a pleasant radish-like taste, when baked it has the taste and texture of baked potato[212]. The roots can be dried, ground into a powder and stored for later use[257]. The globose tubers are up to 20mm in diameter[270]. Leaves - raw or cooked[61, 85].

tcanta None known

dwatta None known

propta Seed - surface sow on a peat based compost in spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 10°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Division of offsets in spring or autumn.

nwatta Prefers a damp peaty soil and a position in full sun[1, 164]. Requires a lime-free soil[164].

## 5.2.294 Allium condensatum

4 tin 8 cyuc 3 kcak 0 tcan 2 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Allium condensatum is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked. The bulb is about 20mm in diameter[266]. Leaves - raw or cooked[177]. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.295 Fritillaria affinis

Chocolate Lily, Checker lily

4 tin 8 cyuc 3 kcak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is up to 2cm long[200].

tcanta RootstockThis species is often used as stock to graft pear cultivars[266].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to about -15°C[200].

## 5.2.393 Pyrus salicifolia

Willow-Leaved Pear

4 tin 8 cyuc 2 kcak 0 tcan 0 dwat 7.5 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hrasljutnyikfrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Pyrus salicifolia is a deciduous Tree growing to 7.5 m (24ft) by 4 m (13ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit - raw or cooked[2, 177]. The fruit is about 2 - 3cm long[200]. Harsh and of no value[11]. The fruit is nice when it has been bletted[74].

tcanta Oil Soil stabilizationPlants have extensive root systems and can be used for binding sands[74].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. The dormant plant is very frost resistant[74]. A very ornamental plant[1].

## 5.2.394 Pyrus betulaeifolia

Birch-Leaved Pear

4 tin 8 cyuc 2 kcak 0 tcan 1 dwat 7.5 m hkuc hmimhtut cyutli hgattcup hwicli hrasljutnyikfrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Pyrus betulaeifolia is a deciduous Tree growing to 7.5 m (24ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium

(loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Fruit LeavesEdible Uses: TeaFruit - raw or cooked[2, 105, 177, 179, 183]. The fruit is quite small, about 15mm in diameter[200]. Leaves - cooked[179, 183]. Flowers[2, 183]. Dried, powdered and made into cakes[179]. The dried leaves are used to make tea[179].

tcanta Miscellany RootstockThis species has long been used as a rootstock for the cultivated pears by the Chinese[11], it is recently also being used as a rootstock in N. America and in Europe[183, 200].

dwatta Cholera MiscellanyThe leaves are used in the treatment of cholera, colic and cramps[218]. The cooked fruit is used to treat mucous diarrhoea[218].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. A fast growing tree[11].

## 5.2.395 Malus hupehensis

Chinese Crab, Chinese crab apple, Tea Crabapple, Flowering Tea Crabapple

4 tin 8 cyuc 2 kcak 0 tcan 0 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprklwis hpa7tmwatli fyfxre7t hjonli

drutta Malus hupehensis is a deciduous Tree growing to 7 m (23ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[105, 177]. Up to 1 cm in diameter[200], it has a sour taste[183]. The leaves are a tea substitute[11, 46, 105]. Palatable and thirst quenching, it is much used in China and leaves are exported from Shasi for this purpose[183].

tcanta Rootstock ShelterbeltA vigorous branching tree, it makes a good windbreak[245]. This species is used as stock to graft apple trees in Hubei and Sichuan[266].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta Landscape Uses:Border, Espalier, Standard, Specimen. An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny

hmimhtut cyutli tcuphja7n hwicli hrasjlutnykfrip hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Malus florentina is a deciduous Tree growing to 8 m (26ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in June, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. The oval fruit is about 15mm long and 8mm wide, it ripens in mid autumn and usually blets on the tree. When bletted, it has a mealy texture with a soft acid flesh, we found it refreshing in small quantities[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. This species is a very good pollinator for the cultivated apples[200]. The fruit is a good wildlife food source, especially for birds[200]. A very ornamental tree, especially when flowering in the spring, it makes a good specimen tree in a lawn[11]. Some botanists believe this species to be a bigeneric hybrid between *M. sylvestris* and *Sorbus terminalis*. They have assigned the name *Mal-orbus florentina* to the plant, but this is not generally accepted[11]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.390 Styrax japonica

Japanese Storax

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 8 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Styrax japonica is a deciduous Tree growing to 8 m (26ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit - raw[105, 177]. The fruit is about 14mm in diameter[200].

tcanta Beads Oil WoodThe fruits are used as beads in rosaries etc[182]. An oil is obtained from the seed[46, 61]. No further details are given. Wood - fine-grained. Used to make umbrella handles[46, 61].

dwatta None known

propta Seed - requires stratification and is best sown in a cold frame as soon as it is ripe[11]. Stored seed requires 3 months warm then 3 months cold stratification[113]. Germination is usually good, prick out the seedlings into individual pots once they are large enough to handle. Overwinter in a greenhouse for the first winter and plant out in late spring. Cuttings of half-ripe wood, July/August in a frame[113]. Layering in autumn.

nwatta Requires a light lime-free soil in sun or semi-shade[11, 200]. If planted out when young into a planting hole that has been filled with a light lime-free soil the plants will successfully grow into the surrounding soil[11].

Prefers a warm sheltered position with protection from the morning sun[11]. Dormant plants are hardy to about -15°C[200] but the young growth is liable to be damaged by late frosts[11]. A very ornamental plant[1] but it is slow to establish itself and is slow growing[200]. There are some named varieties[182]. The sub-species *S. japonica fargesii* is stronger growing in Britain[182]. The flowers have an exquisite scent[245]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.391 Acer argutum

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 8 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Acer argutum is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SapEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or the sap can be concentrated into a syrup by boiling off the water[105, 177]. The syrup is used as a sweetener on many foods. The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta PreservativeThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested ‘green’ (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Cuttings of this species root well.

nwatta Of easy cultivation, it prefers a good moist well-drained soil in a sunny position but tolerates some shade. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. This species prefers its trunk in the shade[11]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Dioecious, male and female plants must be grown if seed is required.

### 5.2.392 Pyrus phaeocarpa

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 7 m hkuc

hmimhtut cyutli htaccup hwicli hrasjlutnykfrip hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Pyrus phaeocarpa is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay

drutta Fritillaria affinis is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root SeedpodEdible Uses: Bulb - raw, cooked or dried for winter use[2, 161]. Rich in starch, the bulb is best used in the autumn[172]. The plant has a small bulb surrounded by rice-like bulblets[256]. Both bulb and bulblets are used, when cooked they are tender and delicate, resembling real rice except for having a slightly bitter taste[256]. The roots were a staple food for some native North American Indian tribes[257]. Immature seedpods - raw or cooked. A bitter flavour[172].

tcanta None known

dwatta None known

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta A woodland plant, preferring light soils[1]. It is best grown in a well-drained sandy woodland soil[42, 90, 134]. Plants are best grown in a bulb frame and kept rather dry in summer[90]. Water should be withheld in summer or hot spells[164]. A very ornamental and polymorphic plant[1]. The sub-species *F. affinis tristulisi* is a triploid form that is exceptionally large flowered, robust and easily cultivated[90]. Plants flower within 3 - 5 years from seed[164].

### 5.2.296 Muscari comosum

Tassel Hyacinth, Tassel grape hyacinth

4 tlin 8 cyuc 3 kcak 2 tcan 1 dwat 0.5 m hkuc

hmimhtut cyutli kyuccup hwicli hrasjlutnyk hpa7tli flat-priklwis hpa7tmwatli fyifxre7t hjonli

drutta Muscari comosum is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[22, 61, 183]. It is about 35mm in diameter[200]. A slightly bitter taste[7] that is appreciated by certain ethnic groups, especially Greeks and Italians[183]. Used in spring[46, 177]. The cooked bulbs, preserved in oil, are used as a relish[183]. tcanta Landscape Uses: Border, Container, Massing, Rock garden, Specimen, forest garden.

dwatta Appetizer Diuretic PoultriceThe bulb is appetizer and diuretic[7, 183]. The bulb is rich in mucilage and can be crushed then applied as a poultice to reddened skin[7].

propta Seed - best sown as soon as ripe in a greenhouse[200]. The seed can also be sown in early spring in a greenhouse. A good proportion of the seed usually germinates within 2 - 3 months. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first year of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in late summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. If you have sufficient seed then it is worthwhile trying sowing it in situ

outdoors in early spring. This is rather a hit and miss method, but a lot less work than indoor sowing. Division of offsets in July/August after the leaves die down[1]. It can be done every other year if a quick increase is required[1]. Larger bulbs can be replanted direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late summer.

nwatta Prefers a rich open well-drained soil[1]. Succeeds in any soil and situation[1, 42]. Does very well in short grass[1], increasing freely and it can become invasive[200]. The flowers have a pleasing perfume[245]. There is at least one named form, selected for its ornamental value[200].

### 5.2.297 Fragaria chiloensis

Beach Strawberry, Pacific beach strawberry, Sandwich beach strawberry

4 tlin 10 cyuc 3 kcak 3 tcan 1 dwat 0.3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Fragaria chiloensis is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[2, 27, 101, 183, 257]. Large, sweet and succulent with a delicate flavour[183]. A delicious taste[K]. The berries can be used to make jams, preserves etc[257]. A tea can be made from the leaves[257].

tcanta Plants spread by means of runners and can be grown as a ground cover[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch. seedy fruit loved by birds. Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wildfires, theses are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level ground covers provide little fuel.

dwatta Antiseptic Astringent Emmenagogue Galactogogue OdontalgicThe plant is antiseptic, astringent, emmenagogue, galactogogue and odontalgic[172]. It has been used to regulate the menstrual cycle[172]. A poultice of the chewed leaves has been used to treat burns[257].

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[27, 200]. Tolerates semi-shade though fruit production will be reduced. Grows best near the coast[27]. Plants like a mulch of pine or spruce leaves[18]. Cultivated for its edible fruit in the Andes[61]. This species, along with *F. virginiana*, is probably a parent of the cultivated strawberries[46]. Dioecious. Male and female plants must be grown if seed is required. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2]. Heat zone 9-1. Can be mown in early spring.

## 5.2.298 Allium sphaerocephalon

Round-Headed Leek

4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli hqatkyuctup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Allium sphaerocephalon is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Edible bulb - raw or cooked[2, 46, 61, 177]. An onion substitute[22]. The bulbs are up to 35mm in diameter[20]. Leaves - raw or cooked[177]. They can be dried for later use[183]. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also thicken the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta An easily grown plant[203]. it prefers a sunny position in a light well-drained soil[1, 90]. Established plants are fairly drought tolerant[190]. The bulbs should be planted fairly deeply[1]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Plants often divide freely at the roots[233]. A good bee plant[163]. The flowers are very attractive to bees[203]. The flowers are sometimes replaced with bulbils[90]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.299 Polygonum bistorta

Bistort, Meadow bistort, Snakeweed

4 tlin 7 cyuc 3 kcaak 2 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli xre7t hjonli

drutta Polygonum bistorta is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: Leaves - raw or cooked[2, 7, 9, 103]. One report says that they are rather bitter[5], but we have found them to have a fairly mild flavour, especially when the leaves are young, though the texture is somewhat chewy when they are eaten raw[7, K]. They make an excellent substitute for spinach[183]. In Northern England the leaves are an ingredient of a bitter Lenten pudding, called Easter ledger pudding, that is eaten at Lent[183]. The leaves are available from late winter in most years and can be eaten until the early autumn though they become much tougher as the season progresses[K]. The leaves are a good source of vitamins

A and C[257], a nutritional analysis is available[218]. Seed - raw or cooked[172]. The seed is very small and rather fiddly to utilize[K]. Root - raw or cooked[7, 172, 257]. Rich in starch and tannin, it is steeped in water and then roasted in order to reduce the tannin content[4, 115]. It is then said to be a tasty and nutritious food[4]. The root has also been boiled or used in soups and stews[183] and can be dried then ground into a powder and used in making bread[4]. The root contains 30% starch, 1% calcium oxalate and 15 - 36% tannin[218].

tcanta TanninThe roots contain up to 21% tannin[223].

dwatta Antidiarrhoeal Astringent Cholera Demulcent Diuretic Dysentery Epilepsy Febrifuge Laxative StypticBistort is one of the most strongly astringent of all herbs and it is used to contract tissues and staunch blood flow[254]. The root is powerfully astringent, demulcent, diuretic, febrifuge, laxative and strongly styptic[4, 218]. It is gathered in early spring when the leaves are just beginning to shoot, and then dried[4]. It is much used, both internally and externally, in the treatment of internal and external bleeding, diarrhoea, dysentery, cholera etc[4, 9, 13, 21, 147, 165, 172]. It is also taken internally in the treatment of a wide range of complaints including catarrh, cystitis, irritable bowel syndrome, peptic ulcers, ulcerative colitis and excessive menstruation[238, 254]. Externally, it makes a good wash for small burns and wounds, and is used to treat pharyngitis, stomatitis, vaginal discharge, anal fissure etc[238, 254]. A mouth wash or gargle is used to treat spongy gums, mouth ulcers and sore throats[254]. The leaves are astringent and have a great reputation in the treatment of wounds[4]. In Chinese medicine the rhizome is used for: epilepsy, fever, tetanus, carbuncles, snake and mosquito bites, scrofula and cramps in hands and feet [301]. Considered useful in diabetes [301].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Container, Ground cover. Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. The plant repays generous treatment[1]. A very cold-hardy plant, tolerating temperatures down to at least -25°c[187]. Bistort was formerly cultivated as a medicinal and edible plant[4], though it has now fallen into virtual disuse. Plants are somewhat spreading, forming quite extensive colonies[187] especially in low-lying pastures[4]. They seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, Edible, Not North American native, Invasive, Suitable for cut flowers, Suitable for dried flowers. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.300 Mentha arvensis

Corn Mint, Wild mint

4 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyikfr hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Mentha arvensis is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them out in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta Landscape Uses:Border, Espalier, Pollard, Screen, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -18°c[202]. A very ornamental plant[1, 11]. There are many named forms, selected for their ornamental value[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. This plant is often confused in cultivation with *C. prunifolia*. 'Splendens'[11]. Special Features:Attracts birds, North American native, Blooms are very showy.

## 5.2.387 Prunus buergeriana

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Prunus buergeriana is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked. The fruit is small, about 5mm in diameter[266], and of inferior quality, though it is sometimes gathered and pickled in salt then used as a condiment or appetizer[2, 177]. It contains a single large seed. Seed - raw or cooked. It is usually salted in the Orient[177]. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta DyeA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113].

Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.388 Prunus davidiana

Chinese Wild Peach

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Prunus davidiana is a deciduous Tree growing to 9 m (29ft) by 9 m (29ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: The seed is used in China as a flavouring in confectionery and some special dishes. They are somewhat bitter due to the presence of prussic acid so should be used in strict moderation[177, 183]. Fruit[183]. The fruit is about 3cm in diameter and contains one large seed[200].

tcanta Dye RootstockUsed as a disease-resistant low-chill rootstock for the cultivated peach, *Prunus persica*[183]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Analgesic Antiasthmatic Anticoagulant Antitussive Aperient Emollient HaemolyticThe seed is analgesic, antiasthmatic, anticoagulant, antitussive, aperient, emollient and haemolytic[176]. It is used in the treatment of amenorrhoea, dysmenorrhoea, traumatic pain due to blood stasis, constipation of aged and debilitated patients, coughs and asthma[176]. The seed contains amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. There are some named varieties selected for their ornamental value[200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants flower very early in the year and the flowers are often damaged by late frosts[188]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.389 Malus florentina

Hawthorn-leaf crab apple

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 8 m hkuc

frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Prefers a good loamy soil and cool moist conditions at the roots[11, 200]. Succeeds in partial shade[200]. Subject to attacks by aphid, especially in hot dry spells[11]. Climbs by twining around other plants[182].

### 5.2.384 Ulmus laciniata

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyultl tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ulmus laciniata is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Inner bark LeavesEdible Uses: Leaves - raw or cooked. Inner bark- cooked. It can be dried, ground into a powder and used as a thickening in soups or added to cereal flours when making bread etc[105, 177].

tcanta WoodNone known

dwatta None known

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. Closely related to *U. glabra*[11]. This species is resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most *E. Asian*, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200].

### 5.2.385 Celtis bungeana

Bunge's hackberry

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc htut cyultli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Celtis bungeana is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow

in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Fruit LeavesEdible Uses: TeaThe plant is a tea substitute[105, 177]. This probably refers to the leaves[K]. Leaves are a savoury addition to rice[105, 177]. Fruit - raw[105, 177]. The fruit is 6 - 8mm in diameter containing a seed 4 - 5mm in diameter[266].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[74, 200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. An 8 year old plant at Kew in 1989 was 3m tall and very healthy with no sign of die-back[K]. Trees can be very long-lived, perhaps to 1000 years[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.386 Crataegus crus

Cockspur Thorn, Cockspur Hawthorn, Dwarf Hawthorn
4 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc hmimhtut cyultli hgatkyuctcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus crus-galli is a deciduous Shrub growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midgees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[62, 101, 105]. A dry flesh, it is used in jellies[43]. The fruit is about 1cm in diameter and is borne in small clusters[200]. It often persists on the tree until spring[200]. This suggests that it does not make very good eating[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Hedge Hedge WoodVery amenable to trimming, the plant can even be cut right back into very old wood and will resprout freely. It is often used as a hedge[82]. Wood - fine-grained, hard and heavy. Used for tool handles etc[46, 61, 227].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it

kcaakta Edible Parts: LeavesEdible Uses: Condi- ment TeaLeaves - raw or cooked. A reasonably strong minty flavour with a slight bitterness, they are used as a flavouring in salads or cooked foods[5, 172, 183]. A herb tea is made from the fresh or dried leaves[21, 183]. An essential oil from the plant is used as a flavouring in sweets and beverages[183]. The leaves contain about 0.2% essential oil[218].

tcanta Essential Repellent StrewingThe plant is used as an insect repellent[18, 20, 99]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. The leaves also repel various insects[257]. An essential oil is obtained from the plant[238]. The yield from the leaves is about 0.8%[240]. The sub-species *M. arvensis* piperascens produces the best oil, which can be used as a substitute for, or adulterant of, peppermint oil[238]. Yields of up to 1.6% have been obtained from this sub-species[240].

dwatta Anaesthetic Antiphlogistic Antiseptic Antispasmodic Aromatic Cancer Carminative Diaphoretic Emmenagogue Febrifuge Galactofuge Salve Stimulant Stomachic-Corn mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. The whole plant is anaesthetic, antiphlogistic, antispasmodic, antiseptic, aromatic, carminative, diaphoretic, emmenagogue, galactofuge, refrigerant, stimulant and stomachic[147, 172, 218]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are a classical remedy for stomach cancer[218]. Another report says that this species is not very valuable medicinally[4]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta An easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. This species tolerates much drier conditions than other members of the genus[238]. Prefers a slightly acid soil[16]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Plants are hardy to at least -15°c[238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. Polymorphic[200]. The whole plant has a very strong, almost oppressive, smell of mint[245]. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near brassicas and tomatoes, helping to deter insect pests[20]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.301 Erythronium grandiflorum

Avalanche Lily, Yellow avalanche-lily
4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.2 m hkuc hmim cyultli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium grandiflorum is a BULB growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil.

kcaakta Edible Parts: Leaves Root SeedpodEdible Uses: Bulb - raw or cooked[2, 46, 85, 105, 161, 257]. The slender bulbs, which are up to 5cm long[270], are usually harvested in the spring as the first leaves appear above ground, they can be stored for some months in a cool place[256]. The raw bulb has a slightly bitter milky taste, the texture is cool and moist inside and so the North American Indians liked eating them on hot days[256]. The cooked bulb has a more starchy texture and a sweet flavour[256, 257]. Stored bulbs develop a sweeter flavour when cooked than fresh bulbs[257]. The Indians always drank water after eating the bulbs because they believed that otherwise they would get sick[256]. Large quantities can have an emetic effect[85]. The bulbs can also be dried for later use[207]. Leaves - raw or cooked[85, 106]. Eating the leaves will greatly reduce the vigour of the bulb, so can only be recommended in times of emergency[K]. Young seedpods - raw or cooked[106, 212]. The cooked pods taste like French beans[212].

tcanta None known

dwatta SkinThe pulverized root was applied to boils and as a wet dressing on skin sores[213, 257].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer; it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Not an easy species to grow in Britain, it prefers a well-drained soil that is wet in spring but rather dry in the summer[90]. Plants are best given perfect drainage[200]. Offsets are freely produced if the plant is growing well[1]. Flowers are produced in 3 - 4 years from seed[164]. Bulbs should be planted about 7cm deep[1].

### 5.2.302 Stellaria jamesiana

tuber starwort

4 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyultl tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Stellaria jamesiana is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young leaves - raw or cooked. Root - raw or cooked. Sweet and pleasant[85].

tcanta None known  
dwatta None known  
propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta We have very little information on this species and do not know if it will be hardy outdoors in Britain, though judging by its native range it should succeed outdoors at least in the milder parts of the country. Prefers a moist loamy site[85]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.303 Oxalis violacea

Violet Wood Sorrel

4 tin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.3 m hkuc  
hminhtut cyutli kyucstup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Oxalis violacea is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: DrinkLeaves - raw or cooked[2, 105, 159, 161]. The acid salty leaves are eaten raw in salads and sandwiches or cooked as a potherb[183].Use in moderation, see notes at top of sheet. Flowers - raw[105, 161]. An attractive and tasty garnish for salads[183]. Root - raw or cooked[105, 161, 183, 257]. A lemon-flavoured drink is made from the leaves[159].

tcanta None known  
dwatta Anthelmintic Antiemetic Blood purifier Cancer SalveThe plant is anthelmintic, antiemetic, blood purifier, cancer and salve[257]. A cold infusion is used to stop a person vomiting[257]. An infusion can be used as a blood purifier, it is said to be a treatment in the early stages of cancer[257]. An infusion of the plant is drunk and also used as a wash in treating children with hookworm[257]. An infusion of the leaves, mixed with oil, can be used as a salve on sores[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a moisture-retentive humus-rich soil in shade or dappled sunlight[200]. Succeeds in dry soils[159]. Grows well in a wild or woodland garden[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.2.304 Campanula garganica

Adriatic Bellflower

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikliwv hpa7tmwatli fyfxre7t hjonli

drutta Campanula garganica is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. The leaves are quite small but have a pleasant mild flavour, and make a very acceptable addition to salads[K]. Flowers - raw or cooked. Slightly sweet[K].

tcanta None known  
dwatta None known  
propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C. Very easy[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Very easy[221]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta An easily grown plant[221], it succeeds in most fertile well-drained soils[233], though it prefers a moist but well-drained sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Flowers most freely when growing in full sun with a good supply of chalk or lime in the soil[221]. Plants grow well in a wall so long as there is some soil for them to root into[219]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Plants are often short-lived, though they are easily propagated by seed or basal cuttings[219, 221]. They also usually self-sow freely[221]. This species is closely related to *C. elatines*[200]. There are some named varieties selected for their ornamental value[200]. ‘Dickson’s Gold’ has golden-green leaves with a pleasant mild flavour[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.305 Allium splendens

Miyama-Rakkyo

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Allium splendens is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw, cooked or pickled[46, 61, 105, 177]. Rather small[183]. The bulbs are about 3 - 7cm long and 5 - 7mm in diameter[200]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce

trees are very shade tolerant, but are subject to frost damage so are best grown in a woodland position which will protect them[200]. Although very cold hardy, this species requires hotter summers than are normally experienced in Britain so is not usually a success here and is very slow growing[200]. The seeds are dispersed after the first frosts[227], they are sometimes gathered and sold in local markets in N. America[82, 227]. Good crops are produced every 2 - 3 years in the wild[227]. This species produces suckers[11] and often forms thickets in the wild[227]. Trees have surface-feeding roots and also cast a dense shade, this greatly inhibits the growth of other plants and, especially where a number of the trees are growing together, the ground beneath them is often almost devoid of vegetation[226, 227]. Special Features: North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.382 Crataegus phaenopyrum

Washington Thorn, Washington Hawthorn

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc  
hminhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrp hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Crataegus phaenopyrum is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[62]. A dry flesh[43]. Very small, about 5mm in diameter, it often hangs on the tree all winter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take

another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed ‘green’ (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta Landscape Uses:Espalier, Firewood, Pollard, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant, there are some named varieties[1, 11, 200]. Special Features: North American native, Attractive flowers or blooms.

## 5.2.383 Loniceraciliosa

Orange Honeysuckle

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc  
hminhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Loniceraciliosa is an evergreen Climber growing to 10 m (32ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit NectarEdible Uses: Fruit - raw or cooked[105, 177, 212]. Not tasty enough to be widely sought[212]. The fruit is about 5mm in diameter[200]. Children enjoy sucking the nectar from the base of the flowers[256, 257].

tcanta Fibre Hair MiscellanyAn infusion of the stems is used as a hair shampoo and tonic to make it grow[99, 257]. A fibre obtained from the stem is used in making mats, bags, blankets etc[99]. The stems were used as building materials by the native North American Indians. They were used with willow withes to reinforce suspension bridges across canyons and rivers. They were also twisted with coyote willow to lash together the framing poles of underground pit houses and to make a pliable ladder[257].

dwatta Contraceptive Epilepsy Miscellany Poulitce TB Women’s complaintsThe leaves are contraceptive and tonic[257]. An infusion has been used as a contraceptive and also as a treatment for problems in the womb[257]. A decoction has been used in the treatment of colds and tuberculosis[257]. A poultice of the chewed leaves has been applied to bruises[257]. An infusion of the woody part of the plant has been drunk in small amounts, or used as a bath, in the treatment of epilepsy[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold



drutta *Pyrus elaeagnifolia* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The flesh is rather tough and gritty, but has a reasonable flavour when it is fully ripe[K]. The fruits are up to 2cm long[200].

tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. The branches are thorny[200]. This species is closely related to *P. nivalis*[11].

## 5.2.380 Halesia tetraptera

Silverbell or Mountain Silverbell

4 tin 8 cyuc 2 kcak 2 tcan 0 dwat 10 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlnutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Halesia tetraptera* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: The ripe fruit is chewed for its acidity and very tart [183]. Unripe fruits are sometimes pickled[2, 183].The fruit is about 4cm in diameter[200].

tcanta Wood - soft, light, close-grained[82]. It weighs 35lb per cubic foot[235]. Good for carving, turnery, crafts, woodenware, pulp [1-2]. Trees occasionally grow large enough for saw timber and are then cut and used for panelling and cabinet making[229]. Coppices readily [1-2].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 113, 200]. It takes 18 months to germinate[113]. Warm stratifying the seed for 2 - 3 months at 14 - 25°C then cold stratifying for 2 - 3 months at 0 - 5°C can reduce the germination time. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of greenwood, 5 - 8cm with a heel, May/June in a frame. Roots in 28 days. A fair percentage[78]. Layering in early spring as the buds break. Takes 12 months. High percentage[78].

nwatta A small understory tree with a broad, rounded crown or a large shrub. It grows well with azaleas and rhododendrons and requires the same environmental conditions of moist, acidic, organically rich soil in part shade. Well-drained[202]. Requires a lime-free soil[200]. Dormant plants are hardy to about -25°C[184]. A very ornamental plant[1, 11], it has a moderate rate of growth and lives about 100 years[229]. It can flower when only 1.2 metres tall[113]. The flowers have a delicate sweet perfume[245]. The subspecies *H. tetraptera monticola* forms a tree about 24 metres

tall. Plants in this genus are notably resistant to honey fungus[200]. *Halesia tetraptera* has a dense crown providing 0 to 33% open space in their silhouette and cast deep shade [1-2]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.2.381 Fagus grandifolia

American Beech

4 tin 8 cyuc 2 kcak 3 tcan 2 dwat 10 m hkuc  
pcimhmimhtut cyutli kyucctup hwicli hrasjlnut hpa7tli flatprikwis hpa7tmwatli hjonli

drutta *Fagus grandifolia* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Inner bark Leaves Oil Oil SeedEc Uses: Coffee Oil OilYoung leaves - raw or cooked as a potherb[183]. A very nice mild flavour but the leaves quickly become tough so only the youngest should be used. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Seed - raw or cooked. Small but very sweet and nutritious[82, 117, 171, 183, 227], it is sold in local markets in Canada and some parts of America[82]. Rich in oil, the seed also contains up to 22% protein[213]. The raw seed should not be eaten in large quantities since it is believed to cause enteritis[159, 226]. It can be dried and ground into a powder, then used with cereal flours in making bread, cakes etc[183]. The germinating seeds can be eaten raw, they are tender, crisp, sweet and nutty[183]. The roasted seed is a coffee substitute[183, 213]. An edible semi-drying oil is obtained from the seed[177, 183]. Inner bark[177]. Dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[213].

tcanta Charcoal Oil Oil WoodThe oil obtained from the seed has been used as a fuel in oil lamps[226]. Wood - strong, hard, heavy, very close grained, not durable, difficult to cure[61, 82, 227]. It weighs 43lb per cubic foot[227]. Harvested commercially, it is used for furniture, flooring, tool handles, crates etc[227]. It makes an excellent charcoal and is used in artwork[61, 227]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Pectoral Skin VermifugeA decoction of the boiled leaves has been used as a wash and poultice to treat frostbite, burns, poison ivy rash etc[213, 222, 257]. The nuts have been eaten as a vermifuge[222, 257]. A tea made from the bark has been used in the treatment of lung ailments[222, 257]. It has also been used to procure an abortion when the mother was suffering[257].

propta Seed - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

nwatta Landscape Uses:Firewood, Pest tolerant, Hedge, Aggressive surface roots possible, Screen, Specimen, Woodland garden. Thrives on a light or medium soil[11], doing well on chalk[1], but ill-adapted for heavy wet soils[1]. Young

blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. This species is closely related to *A. lineare*[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.306 Mentha arvensis villosa

American Wild Mint

4 tin 8 cyuc 3 kcak 0 tcan 2 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlnutnyikrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Mentha arvensis villosa* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. Fragrant and pleasant tasting, the leaves are used as a flavouring in salads or cooked foods[183, 257]. A herb tea is made from the leaves[183, 257].

tcanta Essential Repellent StrewingThe plant is used as an insect repellent[18, 20, 99]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. An essential oil is obtained from the leaves, it is used as a flavouring for toothpastes etc[61]. It contains thymol and pulegone[213].

dwatta Antiseptic Carminative Febrifuge StomachicAmerican wild mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. A decoction of the ground leaves and stems is used to treat feelings of nausea[213]. The tea is also used in the treatment of colds, fevers, sore throats, gas, colic, indigestion etc[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta An easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. This species tolerates much drier conditions than other members of the genus[238]. Prefers a slightly acid soil[16]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Plants are hardy to at least -15°C[238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. The whole plant has a very strong smell of mint[245]. Hybridizes freely with other members of this genus. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near brassicas and tomatoes, helping to deter insect pests[20]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.307 Juniperus communis nana

Juniper

4 tin 10 cyuc 3 kcak 4 tcan 3 dwat 0.5 m hkuc  
hmimhtut cyutli hgtakuyuctup hwicli hyishrasjlnutnyikrip hpa7tli frusflatprikdwisslip hpa7tmwatli nyanhjen hjonli

drutta *Juniperus communis nana* is an evergreen Shrub growing to 0.5 m (1ft 8in) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 2 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Coffee Condiment TeaFruit - raw or cooked[2, 5, 9, 15]. It is usually dried [12]. The fruit is often used as a flavouring in sauerkraut, stuffings, vegetable pates etc, and is an essential ingredient of gin[183]. The aromatic fruit is used as a pepper substitute according to one report[183]. An essential oil is sometimes distilled from the fruit to be used as a flavouring[183]. Average yields are around 1%[7]. The cones are about 4 - 8mm in diameter and take 2 years to mature[200]. Some caution is advised when using the fruit, see the notes above on toxicity. The roasted seed is a coffee substitute[177]. A tea is made by boiling the leaves and stems[161]. A tea made from the berries has a spicy gin-like flavour[183].

tcanta Fibre Fuel Hair Incense Repellent Resin StrewingTinderA decoction of the branches is used as an anti-dandruff shampoo[172]. Yields the resin 'Sandarac', used in the production of a white varnish[74]. The stems were at one time used as a strewing herb[14]. The whole plant can be burnt as an incense and fumigant[66, 102, 146]. It makes a good insect repellent[102, 172]. The bark is used as cordage[61] and as a tinder[172]. An excellent fuel wood[66]. Many forms of this species are good ground cover plants for sunny situations[208].

dwatta Antiseptic Aromatic Carminative Diaphoretic Diuretic Rubefacient Stomachic Tonic UrinaryJuniper fruits are commonly used in herbal medicine, as a household remedy, and also in some commercial preparations. They are especially useful in the treatment of digestive disorders plus kidney and bladder problems[4]. The fully ripe fruits are strongly antiseptic, aromatic, carminative, diaphoretic, strongly diuretic, rubefacient, stomachic and tonic[4, 7, 9, 21, 46, 165, 240, 254]. They are used in the treatment of cystitis, digestive problems, chronic arthritis, gout and rheumatic conditions[254]. They can be eaten raw or used in a tea[222], but some caution is advised since large doses can irritate the urinary passage[4]. Externally, it is applied as a diluted essential oil, having a slightly warming effect upon the skin and is thought to promote the removal of waste products from underlying tissues[254]. It is, therefore, helpful when applied to arthritic joints etc[254]. The fruits should not be used internally by pregnant women since this can

cause an abortion[9]. The fruits also increase menstrual bleeding so should not be used by women with heavy periods[254]. When made into an ointment, they are applied to exposed wounds and prevent irritation by flies[4]. The essential oil is used in aromatherapy. Its keyword is 'Toxin elimination'[210].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in hot dry soils and in poor soils. Succeeds in most soils so long as they are well drained[186], preferring a neutral or slightly alkaline soil. Does well in chalky soils[1]. Grows well in heavy clay soils. Tolerates a pH range from 4 to 8[186]. Succeeds in light woodland but dislikes heavy shade[186]. Established plants are very tolerant of drought[186]. Although the fully dormant plant is cold-tolerant throughout Britain, the young growth in spring can be damaged by late frosts. A very polymorphic species, there is a huge range of cultivars of widely diverse habits[11, 81]. At least some forms tolerate maritime exposure[186], there is a thriving colony in an exposed position at Land's End in Cornwall[81]. Seed takes 2 - 3 years to ripen on the plant[11]. Plants are usually very slow growing, often only a few centimetres a year[186]. Resists honey fungus[88]. Plants are sometimes attacked by a rust, this fungus has an aecidial stage on hawthorn (*Crataegus* spp.)[1]. Dioecious. Male and female plants must be grown if seed is required. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

### 5.2.308 Malva sylvestris

Mallow, High mallow, French Hollyhock, Common Mallow, Tree Mallow, Tall Mallow
4 tin 8 cyuc 3 kcaak 3 tcan 3 dwat 0.5 m hkuc hmimhtut cyutilt tcup hwicli hrasjlytnyuk hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Malva sylvestris is a BIENNIAL/PERENNIAL growing to 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves SeedEdible Uses: TeaLeaves - raw or cooked[2, 4, 7, 9, 94, 183]. Mucilaginous with a mild pleasant flavour, they are nice in soups where they act as a thickener[5]. The young leaves also make a very acceptable substitute for lettuce in a salad[K]. Immature seed - raw[183]. Used as a nibble[183], the seeds have a nice nutty flavour[12] but are too fiddly for most people to want to gather in quantity[K]. Flowers - raw. Added to salads or used as a garnish[183]. A pleasant mild flavour, with a similar texture to the leaves, they make a pleasant and pretty addition to the salad bowl[K]. The leaves are a tea substitute[46, 183].

tcanta Dye Fibre LitmusCream, yellow and green dyes can be obtained from the plant and the seed heads[168]. A tincture of the flowers forms a very delicate test for alkalis[4, 115]. The leaves are used to relieve insect bites and

stings[53]. A fibre obtained from the stems is useful for cordage, textiles and paper making[115].

dwatta Antiphlogistic Astringent Demulcent Diuretic Emollient Expectorant Laxative SalveAll parts of the plant are antiphlogistic, astringent, demulcent, diuretic, emollient, expectorant, laxative, salve[4, 7, 9, 21, 46, 222, 238]. The leaves and flowers can be eaten as part of the diet, or a tea can be made from the leaves, flowers or roots[222]. The leaves and flowers are the main part used, their demulcent properties making them valuable as a poultice for bruise, inflammations, insect bites etc, or they can be taken internally in the treatment of respiratory system diseases and problems with the digestive tract[4, 238, 254]. When combined with eucalyptus it makes a god remedy for coughs and other chest ailments[254]. Mallow has similar properties, but is considered to be inferior to the marsh mallow (*Althaea officinalis*) and are seldom used internally[4]. The plant is an excellent laxative for young children[7]. The leaves can be used fresh whenever they are available or can be harvested in the spring and dried for later use[254]. The flowers are harvested in the summer and can be dried for later use[254]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Malva sylvestris* for cough, bronchitis, inflammation of the mouth and pharynx (see [302] for critics of commission E).

propta Seed - sow early spring in situ. Germination should take place within 2 weeks.

nwatta Landscape Uses:Border, Massing. A very easily grown plant, succeeding in ordinary garden soil[1] and in poor soils[238]. It prefers a reasonably well-drained and moderately fertile soil in a sunny position[200], where it will produce a better crop of salad leaves[K]. Plants are hardy to about -20°c[187]. There are some named forms, selected for their ornamental value[187]. 'Mauritiana' is larger than the type with much more ornamental flowers[187]. The flavour of the leaves and flowers is considered by many to be superior to the type species[183]. Plants seem to be immune to the predations of rabbits[233]. Prone to infestation by rust fungus[200]. Special Features: Not North American native, Naturalizing, Attractive flowers or blooms.

### 5.2.309 Cardamine pratensis

Cuckoo Flower

4 tin 8 cyuc 3 kcaak 2 tcan 2 dwat 0.5 m hkuc hmimhtut cyutilt tcuphja7n hwicli hrasjlytnyuk hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine pratensis is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves and young shoots - raw or cooked[2, 5, 12, 52, 115]. Rich in vitamins and minerals[268], especially vitamin C[238], but with a bitter and pungent flavour[27]. The leaves and young shoots are harvested in the spring and taste rather like water cress[9]. The leaves can be available early in the year[K] and when used in small quantities make a very acceptable addition to salads[183, K]. Flowers and flower buds - raw. A pungent cress-like flavour[183, K]. The white flowers are very attractive, they make a pleasant nibble and also add a delicious flavour to salads[K].

tcanta Attracts wildlife.

dwatta Antirheumatic Antiscorbutic Antispasmodic Carminative Digestive Diuretic Stimulant Vitamin CCuckoo flower is seldom used in herbalism, though an infusion of the leaves has been used to treat indigestion and promote appetite[268]. The leaves and the flowering plant are antirheumatic, antiscorbutic, antispasmodic, carminative, digestive, diuretic, stimulant[9, 146, 172, 238, 240]. They are used internally in the treatment of chronic skin complaints, asthma and hysteria[238]. The plant is harvested in spring and early summer and is best used when fresh[9, 238].

the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 82, 95]. A thin flesh, it is sweet but strongly flavoured of resin and has a mealy texture[82, 85, 229]. Used as a flavouring in stews[216, 257]. The fruit can be eaten fresh or it can be dried and ground into a powder then baked into cakes[61, 82, 183]. The cones are about 6 - 18mm in diameter, they take 2 years to mature[200].

tcanta Beads Fuel Hair Incense Thatching Tinder Wax WoodA wax on the fruit is obtained by simmering the fruit in hot water and skimming off the wax as it rises to the surface. The wax can be used to make aromatic candles[85]. The bark is employed as a tinder and is also made into a slow match[216, 257]. The crushed bark was twisted into a rope, tied at intervals with yucca (*Yucca* species), and wrapped into a coil. The free end was set on fire and kept smouldering by blowing on it at intervals. Fire could be carried in this fashion for several hours[257]. The bark has been used as a thatching on the roofs of buildings[257]. The dried seeds have been used as beads or as the 'rattle' in rattles[216]. An infusion of the plant has been used as a hair wash[257]. The plant has been burnt as an incense and fumigant in the home[257]. Wood - soft, close-grained, slightly fragrant[82]. It is used occasionally for fuel, fencing etc[82, 229].

dwatta Analgesic Antiseptic Blood tonic Diuretic Kidney Laxative Odontalgic Poultice SalveDesert juniper was widely employed medicinally by a number of native North American Indian tribes who used it to treat a variety of complaints, especially those connected to the bladder and kidneys and to the skin[257]. It is little, if at all, used in modern herbalism. The leaves are antiseptic, blood tonic and laxative[216, 257]. A decoction is used in the treatment of constipation[216]. A poultice of the leaves has been applied to the jaw to treat toothaches and sore and swollen gums[257]. A decoction of the young twigs has been used in the treatment of stomach aches, kidney complaints, haemorrhages, coughs and colds[257]. Fumes from the burning twigs have been inhaled in the treatment of headaches and colds[257]. The branches have been used in a sweat bath to treat rheumatism[257]. A strong decoction has been used as an antiseptic wash on sores[257]. A poultice of the mashed twigs has been used as a dressing on burns and swellings[257]. The seeds are analgesic[257]. They have been eaten in the treatment of headaches[257]. The fruits are analgesic, blood tonic and diuretic[257]. A decoction has been used to relieve the pain of menstrual cramps, to induce urination and to treat kidney complaints, fevers, coughs and colds[257]. Externally, a decoction has been used as a poultice on rheumatic joints[257].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11]. Thrives in calcareous soils[1]. A drought tolerant plant once established, succeeding in hot dry positions[200]. A slow-growing but long-lived tree, specimens several centuries old have been recorded[229]. It grows better in dry areas with hot summers, western Britain is generally to cool and wet for this species to thrive[200]. Good crops of fruit are produced in alternate years in the wild[229]. Closely related to *J. cali-*

formica[1, 82]. This species is resistant to honey fungus[88]. The seed takes 2 years to mature[200]. Plants are usually dioecious, though occasional trees with both male and female flowers are sometimes found[229]. Male and female plants must usually be grown if seed is required. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

### 5.2.378 Acer carpinifolium

Hornbeam Maple

4 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutilt tcup hwicli hrasjlytnyukfrip hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Acer carpinifolium is a deciduous Shrub growing to 10 m (32ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SapEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[105, 177]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (*A. saccharum*). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta PreservativeThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Grafting is impossible for this species because no compatible rootstock has been discovered.

nwatta Of easy cultivation, it prefers a good moist well-drained soil[11], preferring a sunny position but tolerating some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. This species is dioecious, at least one male plant needs to be grown with up to 5 females if seed is required. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 5.2.379 Pyrus elaeagnifolia

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutilt hgatyuctcup hwicli hrasjlytnyukfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

tcanta Dye Shelterbelt WoodA yellow-tan dye is obtained from the leaves[106, 115]. Trees are sometimes used as part of a shelterbelt planting[227]. Wood - heavy, tough, durable, fine grained, hard. It weighs 51lb per cubic foot[227]. Used by cabinet and instrument makers[11, 61, 100, 149]. When covered with black varnish it is an excellent ebony substitute[74].

dwatta Astringent Febrifuge SedativeThe fruit is astringent, febrifuge and sedative[240].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[1, 200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types, if they are moderately fertile[200], avoiding only the most acid soils[186]. Dislikes very exposed positions[186]. Established plants are drought tolerant[200]. A very hardy plant, tolerating temperatures down to below -15°C[200]. Plants often sucker and can form dense thickets[186]. A parent of the cultivated pear, possibly by crossing with *P. nivalis* and *P. cordata*[11]. There are many hundreds of varieties of cultivated pears and they are widely cultivated in the temperate zone for their edible fruits. By selection of varieties fresh fruit can be obtained from late July to April or May of the following year. Special Features: Edible, Not North American native, Naturalizing, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.2.375 Celtis koraiensis

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 12 m hkuc htuc cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Celtis koraiensis is a deciduous Tree growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177]. The fruit is about 10mm in diameter[200] with a thin flesh and a single large seed[K].

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed

can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. Trees can be very long-lived, perhaps to 1000 years[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.376 Sorbus intermedia

Swedish Whitebeam

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikli-wisslip hpa7tmwatli wixfjyre7t hjonli

drutta Sorbus intermedia is a deciduous Tree growing to 12 m (39ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3]. A mild, though slightly bitter flavour with a mealy texture[K]. The fruit is up to 13mm across[200] and is produced in quite large clusters, making harvesting easier[K].

tcanta Hedge Hedge ShelterbeltResistant to maritime exposure, this tree can be used as a part of a shelterbelt planting[75, 200]. If regularly trimmed it can be used as a dense deciduous hedge[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good well-drained soils in an open sunny position[11]. Tolerates very acid or alkaline soils[200] and light shade[188], though it fruits better in a sunny position[K]. Suitable for very exposed sites, including maritime exposure[75, 200]. Tolerates atmospheric pollution[11, 200]. Resistant to firebright[11]. The trees usually have apomictic flowers. They thus produce seed asexually, each seedling being a clone of the parent[11]. The fruits are very attractive to birds[11].

### 5.2.377 Juniperus osteosperma

Desert Juniper, Utah juniper

4 tlin 8 cyuc 2 kcaak 3 tcan 2 dwat 12 m hkuc

htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli nyanhjen hjonli

drutta Juniperus osteosperma is an evergreen Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and

propta Seed - sow outdoors in a seedbed in a shady position in April. Plant out in autumn or spring. Division in spring or autumn[238]. The plant produces young plants at the base of its leaflets. When large enough, these can be easily separated from the main plant and grown on as individual plants[K].

nwatta Succeeds in most soils[1, 111] so long as they are moist or wet[187, 188]. Prefers a cool damp soil[111]. Succeeds in full sun or partial shade[238]. Cuckoo flower was at one time much used as a spring salad plant and was often sold in local markets. It has, however, fallen out of favour and is scarcely used at present[268]. A polymorphic species[17]. A very ornamental plant, non-invasive and well suited to the wild garden though it may require protection from wood pigeons who eat out the young buds in spring[187]. It grows well in the spring meadow[24]. A food plant for the orange tip butterfly[24]. There is at least one named variety, selected for its ornamental value. ‘Flore Pleno’ is a double flowered form[187]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.310 Yucca angustissima

Narrowleaf yucca, Kanab yucca, Toft’s yucca, Yucca

4 tlin 9 cyuc 3 kcaak 4 tcan 0 dwat 0.4 m hkuc

hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Yucca angustissima is an evergreen Shrub growing to 0.4 m (1ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Fruit StemEdible Uses: Fruit - the immature fruit is cooked[85]. Baked in an oven[216]. A bitter taste, the bitterness is in the skin[85]. The fruit is about 6cm long and 2.5cm wide[200]. Flowers - raw or cooked. They are delicious raw, or can be dried, crushed and used as a flavouring[85]. Flowering stem - peeled, cooked and used like asparagus. The whitish inner portion is used[85].

tcanta Basketry Broom Brush Fibre SoapA fibre obtained from the leaves is used for making ropes, baskets and mats[85]. The leaves are very fibrous and can be used as paint brushes[92] or as a broom or woven to make mats etc[85]. They are also used in basketry[216]. The roots are rich in saponins and can be used as a soap substitute[85, 216].

dwatta None known

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°C. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings

in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots in a greenhouse until established[78].

nwatta Landscape Uses:Border, Massing, Specimen. Thrives in any soil but prefers a sandy loam and full exposure to the south[11]. Plants can succeed in light shade[K]. They are harder when grown on poor sandy soils[200]. Established plants are very drought resistant, this species is also tolerant of damp weather[11]. Plants are not hardy in the colder areas of the country, they tolerate temperatures down to about -10° if in a suitable location[11, 200]. Closely allied to *Y. glauca*[11]. The plant has a thick prostrate rootstock[11]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in later years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]. Special Features:North American native, Fragrant flowers, Attractive flowers or blooms.

### 5.2.311 Lycopus uniflorus

Bugleweed, Northern bugleweed

4 tlin 8 cyuc 3 kcaok 0 tcan 1 dwat 0.3 m hkuc

hmimhtut cyutli tcupha7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lycopus uniflorus is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[55, 61, 62, 105, 161]. The roots were a staple food for some native North American Indian tribes[257]. The crisp white tubers can be eaten raw in salads or cooked in soups etc[183]. When boiled for a short time they are said to make an agreeable vegetable, somewhat like Chinese artichokes (*Stachys affinis*) [183].

tcanta None known

dwatta Antitussive SedativeThe whole plant is antitussive and sedative[61].

propta Seed - sow spring or autumn in a cold frame[238]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring or autumn[238]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of the country. This species might be no more than a synonym for *L. virginicus*, a species known to be hardy in Britain. The following notes are based on the general needs of the genus. Tolerates most soil types so long as they are wet. Succeeds in damp meadows or in wet places by ponds or streams[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.312 Balsamorhiza incana

Hoary Balsamroot

4 tin 8 cyuc 3 kcaok 0 tcan 1 dwat 0.9 m hkuc  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Balsamorhiza incana is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[105, 161, 177]. The thick root can be eaten raw[257]. Seed - raw or cooked. It can be ground into a powder and made into a bread.

tcanta None known

dwatta Analgesic StomachicA decoction of the leaves, roots and stems has been used in the treatment of stomach pains and colds and as a steam bath for treating headaches[257].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination usually takes place within 2 - 6 days at 18°C. Either sow the seed in individual pots or pot up the seedlings as soon as they are large enough to handle and plant them out into their permanent positions in the summer[134]. Division in spring. Very difficult since the plant strongly resents root disturbance[134]. It is probably best to take quite small divisions, or basal cuttings, without disturbing the main clump. Pot these up into individual pots and keep them in light shade in the greenhouse until they are growing away well. Plant them out in the summer if they have grown sufficiently, otherwise over-winter them in the greenhouse and plant out in late spring.

nwatta Requires a deep fertile well-drained loam in full sun[134, 200]. Plants strongly resent winter wet[134, 200]. Hardy to at least -25°C[200]. Plants are intolerant of root disturbance and should be planted into their permanent positions whilst still small[134].

## 5.2.313 Spinacia oleracea

Spinach

4 tin 8 cyuc 3 kcaok 1 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws  
hpa7tmwatli nyanhjen hjonli

drutta Spinacia oleracea is a ANNUAL growing to 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: ColouringLeaves - raw or cooked[1, 2, 16, 37, 132]. Tender young leaves can be added to salads, older leaves are used as greens or added to soups etc[183, 201]. The leaves contain oxalic acid (6 - 8% in young leaves, 23 - 27% in the cotyledons)[218], see the notes above on toxicity. A nutritional analysis of the leaves is available[218]. Seeds - raw or cooked. It can be sprouted and added to salads[183]. Chlorophyll extracted from the leaves is used as an edible green dye[142].

tcanta DyeA yellow dye is obtained from the leaves[100].

dwatta Appetizer Carminative Febrifuge Hypoglycaemic Laxative UrinaryThe plant is carminative and laxative[218]. In experiments it has been shown to have hypoglycaemic properties[218]. It has been used in the treatment of urinary calculi[240]. The leaves have been used in the treatment of febrile conditions, inflammation of the lungs and the bowels[240]. The seeds are laxative and cooling[240]. They have been used in the treatment of difficult breathing, inflammation of the liver and jaundice[240].

propta Seed - sow in situ from March to June for a summer crop. Make successional sowings, perhaps once a

month, to ensure a continuity of supply. The seed germinates within about 2 weeks and the first leaves can be harvested about 6 weeks later. Seed is sown in situ during August and September for a winter crop.

nwatta Plants grow best and produce their heaviest crop of leaves on a nitrogen-rich soil[16, 37, 200]. They dislike very heavy or very light soils[37]. They also dislike acid soils, preferring a neutral to slightly alkaline soil[200]. Plants require plenty of moisture in the growing season, dry summers causing the plants to quickly run to seed[27]. Summer crops do best in light shade to encourage more leaf production before the plant goes to seed[27], winter crops require a warm dry sunny position[1, 27]. Young plants are hardy to about -9°C[200]. Spinach is often cultivated for its edible leaves, there are some named varieties[132, 183]. These varieties can be grouped into two main types as detailed below:- Forms with prickly seeds. These are the more primitive forms. Their leaves are more lobed and they are in general more cold tolerant and also more resistant of summer heat[264]. They were more often used to produce a crop in the winter[200, 264]. Forms with round seeds have been developed in cultivation, These have broader leaves, tend to be less cold hardy and were also more prone to bolt in hot weather[264]. They were used mainly for the summer crop[200]. Most new cultivars are of the round seeded variety and these have been developed to be more resistant to bolting in hot weather, more cold tolerant, to produce more leaves and also to be lower in calcium oxalate which causes bitterness and also has negative nutritional effects upon the body[264]. Some modern varieties have been developed that are low in oxalic acid. Edible leaves can be obtained all year round from successional sowings[200]. The summer varieties tend to run to seed fairly quickly, especially in hot dry summers and so you need to make successional sowings every few weeks if a constant supply is required. Winter varieties provide leaves for a longer period, though they soon run to seed when the weather warms up. Spinach grows well with strawberries[18, 20]. It also grows well with cabbages, onions, peas and celery[201]. A fast-growing plant, the summer crop can be interplanted between rows of slower growing plants such as Brussels sprouts. The spinach would have been harvested before the other crop needs the extra space[200]. Spinach is a bad companion for grapes and hyssop[201]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.314 Brassica oleracea gongyloides

Kohl Rabi

4 tin 8 cyuc 3 kcaok 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli hgattcup hwicli hrasjlutnyikfrfp hpa7tli flatprikliws  
hpa7tmwatli fyifxre7t hjonli

drutta Brassica oleracea gongyloides is a BIENNIAL growing to 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves StemEdible Uses: Leaves - cooked[142]. Used as a vegetable, though the quality is not as good as cabbage. The young leaves can also be added to salads, though some people find them difficult to digest. A nutritional analysis is available[218]. Stem - raw or cooked. The plant produces a swollen stem just above ground level, and this is often used as a root vegetable[K]. It has a mild cabbage flavour, when finely grated it makes a good addition to mixed salads and, when cooked, is an excellent vegetable[K]. It is best eaten whilst fairly small and tender, between golf ball and tennis ball size. It becomes coarse with age[33, 116, 142]. A nutritional analysis is available[218].

of cold stratification, some species taking 2 or more years to germinate[K]. We sow the seed of temperate species in a cold frame as soon as we receive it, and would sow the seed as soon as it is ripe if we could obtain it then[K]. When the seedlings eventually germinate, prick them out into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first year, though we normally grow them on in pots for 2 years. Plant them out into their permanent positions in early summer. Division in early spring as new growth begins[238]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them out in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings of half-ripe shoots, July in a frame[238].

nwatta Succeeds in most soils in sun or semi-shade[200]. Plants are hardy to about -15°C[200]. A very ornamental plant[1], it thrives in Britain[11]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.372 Nyssa sylvatica

Black Tupelo, Blackgum, Sour Gum, Black Tupelo

4 tin 9 cyuc 2 kcaok 0 tcan 1 dwat 15 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli prikliws  
hpa7tmwatli xre7t hjonli

drutta Nyssa sylvatica is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf from May to October, in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A thin sharply acid pulp that is pleasant to roll in the mouth as a masticatory[183], it is also used in preserves[177, 183]. Pleasantly acidulous[2]. The fruit is up to 15mm in diameter and is borne in small clusters of 2 - 3[82, 200].

tcanta WoodWood - tough, not durable, soft, heavy, hard to work and warps easily. It has an intricately contorted and twisted grain[82]. It weighs 40lb per cubic foot and is used for making boxes, soles of shoes, wooden pipes, wheel hubs, veneer etc[43, 46, 61, 82, 171, 227, 235].

dwatta Emetic Ophthalmic VermifugeThe bark is emetic, ophthalmic and vermifuge[257]. An infusion has been used as a bath and also given to children with worms[257]. A strong decoction is used to cause vomiting when unable to retain food[257]. A strong ooze from the roots is used as eye drops[257].

propta The seed can be sown in late winter in a cold frame[78] but would probably benefit from an earlier sowing if the seed can be obtained any sooner. Three months stratification at 5°C improves germination[200]. Germination rates are variable[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Give the plants some protection from the cold for their first winter outdoors. Cuttings of half-ripe wood, July/August in a frame. Layering.

nwatta Landscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible, Specimen. Although this is a plant of swamps and other wet soils in the wild, once established it can succeed in Britain when growing in an ordinary good loamy soil in sun or semi-shade[11, 200]. It prefers a neutral to alkaline soil according to one report[200], whilst another says that it requires a lime-free soil[98]. Tolerates atmospheric pollution and growing in maritime regions[200]. A very ornamental tree[1], it has a moderate rate of growth and moderate longevity[229]. Resents root disturbance, it is difficult to transplant except when young[11]. The tree does not come into leaf until late May. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Wetlands plant, Attracts butterflies, Inconspicuous flowers or blooms.

## 5.2.373 Ulmus davidiana

Japanese Elm

4 tin 8 cyuc 2 kcaok 0 tcan 0 dwat 15 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Ulmus davidiana is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Inner bark LeavesEdible Uses: Leaves - raw or cooked[105, 177]. Young fruits - cooked[105, 177]. Inner bark - dried, ground into a powder and used as a thickening in soups or added to cereal flours when making bread etc[105, 177].

tcanta Fibre WoodA fibre is obtained from the inner bark[189]. The bark is soaked for 7 - 10 days in water, the inner and outer barks are then separated and the inner bark is stripped into strands and made into thread by chewing it. It is made into a coarse fabric[189]. Wood - heavy, difficult to work. Used for axles, hubs etc[46, 61].

dwatta None known

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but it is easily grown in any soil of at least moderate quality so long as it is well drained[1]. This species is resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. Closely related to U. japonica[200].

## 5.2.374 Pyrus communis

Wild Pear, Common pear

4 tin 9 cyuc 2 kcaok 3 tcan 1 dwat 13 m hkuc  
hmimhtut cyutli hgattcup hwicli hrasjlutnyikfrfp hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Pyrus communis is a deciduous Tree growing to 13 m (42ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 5]. The fruit of wild pears often remains very hard unless bletted[186]. It is more suitable for use in pies etc. The fruit is up to 5cm long[200].

it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. Leaves - cooked. A famine food when all else fails[179]. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - very hard, strong, red-brown in colour. Used for farm implements etc[61, 146].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Trees are often coppiced in China[109]. The seed ripens in its first year[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.370 Ilex opaca

American Holly

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex opaca is an evergreen Shrub growing to 15 m (49ft) by 1.5 m (5ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from May to June, and the seeds ripen from November to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: Edible Uses: TeaThe roasted leaves are used as a tea substitute[161, 177]. They do not contain caffeine[183]. The drink was a very popular tea substitute during the American Civil war[183].

tcanta Dye Hedge Hedge Shelterbelt WoodA number of cultivars of this species are used for hedging[200]. Fairly wind-resistant, this species is also used in shelterbelt plantings[200]. A dye has been made from the berries - the colour is not given[257]. Wood - light, tough, not strong, close grained, highly shock resistant, easily worked[82, 149, 171, 229]. A strikingly white wood, it is valued for use in veneers and inlay[274]. It weighs 36lb per cubic foot[235]. Too small for commercial exploitation, but it is valued for use in cabinet making and the interior finishes of houses[82], it is also used for making small items such as tool handles[149, 171, 229]. The wood can also be stained to imitate ebony[171].

dwatta Antiperiodic Diuretic Emetic Epilepsy Laxative Malaria Ophthalmic SkinThe berries are laxative, emetic and diuretic[222]. They are used in the treatment of children's diarrhoea, colic and indigestion[222]. A tea made from the leaves has been used as a treatment for measles, colds etc[222, 257]. The leaves have also been used externally in the treatment of sore eyes, sore and itchy skin[222, 257]. A tea made from the bark was once used in the treatment of malaria and epilepsy[222]. It has also been used as a wash for sore eyes and itchy skin[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged. Fairly wind-resistant[200]. Plants are hardy to about -25°c[184]. A slow-growing and long-lived species in the wild[229], but it does not thrive or fruit well in British gardens[182]. Plants do not thrive in a maritime climate[188]. There are many named forms, selected for their ornamental value[182, 200]. The leaves remain on the plant for about 3 years, falling in the spring[82]. Flowers are produced on the current year's growth[229]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.371 Smilax hispida

Hag Briar

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatpriklwisslip hpa7tmwatli nyanhjen hjonli

drutta Smilax hispida is a deciduous Climber growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves RootEdible Uses: Leaves and young shoots - raw or cooked[102]. Root - cooked. It can be dried, ground into a powder and then used with cereals for making bread etc[2, 62, 102]. It can also be used as a gelatine substitute[2, 62, 102].

tcanta None known

dwatta Birthing aid Poultice RubefacientThe stem prickles have been rubbed on the skin as a counter-irritant to relieve localised pains, muscle cramps and twitching[222]. A tea made from the leaves and stems has been used in the treatment of rheumatism and stomach problems[222]. The wilted leaves are applied as a poultice to boils[222]. A tea made from the roots is used to help the expelling of afterbirth[222]. Reports that the roots contain the hormone testosterone have not been confirmed, they might contain steroid precursors, however[222].

propta Seed - sow March in a warm greenhouse[1]. This note probably refers to the tropical members of the genus, seeds of plants from cooler areas seem to require a period

tcanta None known

dwatta Digestive TonicThe leaf is digestive and tonic[218].

propta Seed - sow April to August in situ. Earlier sowings can be made under cloches.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Succeeds in any reasonable soil, though it is best not grown in an acid soil[16, 33]. Tolerates a pH in the range 4.5 to 7.5. Prefers some shade and plenty of moisture in the growing season[20, 37]. Established plants are drought tolerant but the best stems are formed when the plant does not go short of moisture[20, 37]. Succeeds in maritime gardens[200]. Very winter hardy, kohlrabi withstands severe frosts and so can be left in the ground all winter in most areas and be harvested as required. The young growing plant, however, is sensitive to low temperatures and a week at 10°c will cause the plants to bolt[200]. It grows best at a temperature between 18 and 25°c[200]. Kohlrabi is often cultivated for its edible swollen stem which can be available almost all year round from successional sowings. There are several named varieties and stem colour can range from white to green and purple[200]. Green forms are faster to mature and so more suitable for early sowings, the purple forms are harder and later to mature, they are used mainly for winter crops[200]. Very fast growing, the stems of some cultivars can be harvested 6 - 8 weeks after sowing[33]. The plant is more tolerant of drought and high temperatures than turnips, which it resembles in flavour, and so it is often grown as a substitute for that species[200]. Grows well with onions, beet and aromatic herbs which seem to reduce insect predations[18, 20, 201]. Plants also grow well with cucumbers, the roots of each species occupying different levels in the soil[201]. Grows badly with strawberries, runner beans and tomatoes[18, 20, 201].

### 5.2.315 Hosta longipes

4 tlin 8 cyuc 3 kcak 3 tcan 0 dwat 0.3 m hkuc pcmhmimhtut cyutli hgattcup hwicli hrasljutnykifrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hosta longipes is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

ckakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked. Sourish[105]. A very acceptable taste, but somewhat fibrous[K].

tcanta A good ground cover plant, succeeding in dense shade.

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Another report says that once established it is drought tolerant[187]. Does well in the semi-shade of a woodland[200] also succeeding in deeper shade[187]. In general, the sunnier the position the moister

the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. A vigorous plant, forming medium sized clumps. The roots travel extensively[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. Hybridizes freely with other members of this genus, especially with *H. kikutii*[200].

### 5.2.316 Melissa officinalis

Lemon Balm, Common balm, Bee Balm, Sweet Balm, Lemon Balm

4 tlin 8 cyuc 3 kcak 3 tcan 5 dwat 0.7 m hkuc hmimhtut cyutli hgatkyuctup hwicli hrasljut hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Melissa officinalis is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

ckakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. A pleasant lemon-like aroma and flavour, they are used mainly as a flavouring in salads and cooked foods[5, 7, 8, 9, 14, 27, 183]. A lemon-flavoured tea can be made from the fresh or dried leaves[21, 183]. A bunch of the leaves can be added to china tea, much improving the flavour, the leaves are also added to fruit cups etc[4]. They are used as a flavouring in various alcoholic beverages including Chartreuse and Benedictine[238].

tcanta Essential Pot-pourri RepellentLandscape Uses: Border, Container, Rock garden. The growing plant is said to repel flies and ants[14]. It is also rubbed on the skin as a repellent[238], though the essential oil would be more effective here[K]. An essential oil is obtained from the plant[100] (the exact part is not specified, it is probably the entire plant and especially the flowering stems). It is used medicinally. The whole plant is very pleasantly aromatic, the aroma lasting for a long time after the plant has been harvested. It is therefore a very useful ingredient in pot-pourri[4]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antianxiety Antibacterial Antidepressant Antiemetic Antispasmodic Antiviral Aromatherapy Carminative Diaphoretic Digestive Emmenagogue Febrifuge Sedative TonicLemon balm is a commonly grown household remedy with a long tradition as a tonic remedy that raises the spirits and lifts the heart[254]. Modern research has shown that it can help significantly in the treatment of cold sores[254]. The leaves and young flowering shoots are antibacterial, antispasmodic, antiviral, carminative, diaphoretic, digestive, emmenagogue, febrifuge, sedative, and tonic[4, 7, 9, 21, 165, 238]. It also acts to inhibit thyroid activity[238]. An infusion of the leaves is used in the treatment of fevers and colds, indigestion associated with nervous tension, excitability and digestive upsets in children, hyperthyroidism, depression, mild insomnia, headaches etc[4, 9, 238]. Externally, it is used to treat herpes, sores, gout, insect bites and as an insect repellent[238]. The plant can be used fresh or dried, for drying it is harvested just before or just after flowering[9]. The essential oil contains citral and citronella, which act to calm the central nervous system and are strongly antispasmodic[254]. The plant also contains polyphenols, in particular these combat the herpes simplex virus which produces cold sores[254]. The essential oil is used in aromatherapy. Its keyword is 'Female aspects'[210]. It is used to relax and rejuvenate, especially in cases of de-

pression and nervous tension[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Melissa officinalis* for nervousness and insomnia (see [302] for critics of commission E).

propta Seed - sow spring or autumn in a cold frame. Germination can be slow[200]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when the plants are at least 15cm tall[K]. If there is plenty of seed it can be sown in an outdoor seed bed in April. Plant out into their permanent positions the following spring. Division in spring or autumn[111]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings in July/August.

nwatta A very easily grown plant, it succeeds in any well-drained soil in a sunny sheltered position[200]. It prefers a light rich moist soil[37, 52], a warm position[27, 37] and partial shade[4]. Once established, this is a drought tolerant species[190, 200], it is a useful plant to try in difficult dry places[187], usually succeeding in the dustiest of soils once it is established[190]. Lemon balm is often grown in the herb garden, and sometimes also commercially[46], there are some named varieties[183]. Plants can often self-sow so freely as to become a menace[187]. If the plants are cut back hard after flowering, they will produce a fresh flush of leaves[238]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A good bee plant[4, 8, 24]. A good companion plant, especially for brassicas[14]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.317 *Epilobium latifolium*

River Beauty

4 tlin 8 cyuc 3 kcaak 1 tcan 2 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Epilobium latifolium* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves Stem Edible Uses: Tea Young shoots - cooked. Used like asparagus[85, 105, 172]. Very poor quality[2]. Young leaves - raw[172, 183]. They become bitter with age[85]. A good source of vitamins A and C[257]. Flower stalks - raw or cooked. Eaten when the flowers are in bud[85]. The dried leaves are used as a tea substitute[85, 177, 183]. The core of mature stems is eaten raw. Slightly sweet, tender and pleasant tasting[85, 172]. Very fiddly though[85].

tcanta Attractive flowers.

dwatta Analgesic Antidote Antiinflammatory Antipruritic Antirheumatic Febrifuge The entire plant is used in Tibetan medicine, it is said to have a bitter taste and a cooling potency[241]. Analgesic, antidote, anti-inflammatory,

antipruritic, antirheumatic and febrifuge, it is used in the treatment of fevers and inflammations, plus also itching pimples[241].

propta Seed - sow early spring in situ or as soon as the seed is ripe. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a well-drained but moisture retentive soil in a sunny position[200]. Succeeds in most soils[1]. The roots are somewhat spreading and the plant can become invasive[233]. The plant is heat tolerant in zones 7 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 5.2.318 *Allium oleraceum*

Field Garlic

4 tlin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljut nyik hpa7tli flatprikkwis hpa7tmwatli fyfxre7t hjonli

drutta *Allium oleraceum* is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves Root Edible Uses: Bulb - raw or cooked[2, 22]. Used as a garlic flavouring in soups etc[12, 105, 115, 177]. The bulbs are 10 - 20mm in diameter[200]. Leaves - raw or cooked. The young leaves are used as a garlic flavouring in soups and stews, but are inferior to that species[2, 61]. Flowers - raw. Used as a garnish on salads. Used mainly as a flavouring in soups and stews[183]. Bulbs - raw or cooked.

tcanta Repellent The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required. Bulbs can be harvested in late summer and planted out immediately.

nwatta An easily grown plant, it prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Seed is rarely if ever produced in Britain[17]. The plant usually produces many small bulbs in the flowering head and these can spread themselves freely around the garden[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the

duce seed in about 10 years from sowing[98]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 5.2.367 *Vitis amurensis*

Amur River Grape, Amur grape

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 15 m hkuc hmimhtut cyutli kyuctup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Vitis amurensis* is a deciduous Climber growing to 15 m (49ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit Leaves Edible Uses: Fruit - raw, cooked or dried for winter use[183]. It can also be made into drinks[177]. The fruit is much esteemed[151]. Small and somewhat harsh in flavour[151], it is succulent but usually bitter[200]. The fruit is about 16mm long and 10mm wide[200]. Young leaves - cooked[179]. Used as a boiled vegetable[183]. The leaves can also be wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta Dye A yellow dye is obtained from the fresh or dried leaves[168].

dwatta Tonic The root is tonic[218].

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Very hardy, tolerating temperatures down to about -40°C, this species is a potential source of hardiness in a breeding programme with the common grape, *Vitis vinifera*[183]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.368 *Ulmus pumila*

Siberian Elm, Hybrid elm

4 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 15 m hkuc hmimhtut cyutli hgtakyuctup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Ulmus pumila* is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower in April, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Fruit Inner bark Leaves Edible Uses: Leaves - raw or cooked[105, 177, 183]. Used as a

potherb[218]. Inner bark - cooked. It can be dried and made into noodles[105, 177, 183]. The dried inner bark can also be ground into a powder and then used as a thickener in soups or added to cereal flours when making bread etc. Fruit - raw or cooked[105, 177]. Used when immature, it can be made into a sauce and a wine[183]. The fruit is about 10mm in diameter[200].

tcanta Fibre Fodder Shelterbelt Wood A coarse cloth is made from the inner bark[149]. A fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - hard, heavy, tough, difficult to split. Used for agricultural implements, boat making etc[149].

dwatta Antibilious Antidote Demulcent Diuretic Febrifuge Lenitive Lithotropic Poulitice The leaves are diuretic and febrifuge[218]. They are used as a pot herb and are then said to be antibilious, antidote and lithotropic[218]. The stem bark is demulcent, diuretic, febrifuge and lenitive[218]. It is mixed with oil and vinegar then used as a poultice on abscesses, mastitis and swellings[218].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Landscape Uses: Firewood, Aggressive surface roots possible. Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. Succeeds in a hot dry position[200]. Established plants are drought resistant[11, 200]. Fairly wind-tolerant[200]. This species, or at least some of its cultivars[200], is resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. Special Features: Not North American native, Invasive, Naturalizing, Inconspicuous flowers or blooms.

### 5.2.369 *Quercus serrata*

Bao li

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 15 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta *Quercus serrata* is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Leaves Seed Edible Uses: Coffee Seed - cooked. Highly nutritious[179]. The seed is about 15mm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost[179]. Either the whole seed can be used or the seed can be dried and ground



of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted. The seed ripens in its first year. Closely related to *Q. petraea*[1]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.365 Vitis cordifolia

Frost Grape

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc  
hmimhtut cyutli kyucctup hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta *Vitis cordifolia* is a deciduous Climber growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw, cooked or dried for winter use[1, 2, 161]. They are said to be unpalatable until they have been touched by frost[1, 11, 43, 182, 200]. A spicy flavour[177]. Quite tasty[219]. The fruit is about 8 - 12mm in diameter[200] and is produced in fairly large bunches[235]. Leaves - cooked[55]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked[55, 85]. The twigs are a tea substitute[161].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200], doing well when lime rubble is incorporated into the soil[245]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. A very vigorous plant[200], climbing by means of tendrils[182]. It grows particularly well into elm trees[18]. The flowers are sweetly scented[245]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This species is often confused with *V. vulpina*[182]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.366 Acer campestre

Field Maple, Hedge maple

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 15 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikli-wisslip hpa7tmwatli hjonli

drutta *Acer campestre* is a deciduous Tree growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta The sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[4]. The concentration of sugar is considerably lower than in the sugar maples (*A. saccharum*). The syrup is used as a sweetener on many foods. The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta Charcoal Fuel Hedge Hedge Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. A fast growing plant and bearing clipping well, it makes an excellent clipped hedge and can also be used as part of a native wildlife hedge where it is only trimmed every 3 - 4 years[200, K]. It has also been used in topiary[200]. Wood - fine-grained, tough, elastic, hard to split, takes a high polish and is seldom attacked by insects. Trees are seldom large enough to supply much usable timber, but when available it is much valued by cabinet makers[4, 7, 13, 46, 115]. It is also used for cups bowls etc[115]. The wood of the roots is often knotted and is valued for small objects of cabinet work[4]. The wood is an excellent fuel[4]. A charcoal made from the wood is a good fuel[4, 115].

dwatta Anticholesterolemic AstringentThe bark is astringent and slightly anticholesterolemic[7]. A decoction has been used to bathe sore eyes[7]. The bark should be sundried and then stored in a dry place until required[7].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Firewood, Pollard, Screen, Standard, Superior hedge, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil[11] in a sunny position but tolerates some shade[11, 200]. Does well on chalky soils, tolerating a pH as high as 8, but becoming a shrub in such conditions[186]. Does not thrive in soils with a pH much below 6[186]. Grows well in heavy clay soils. Tolerates atmospheric pollution[200]. Growth is fast once the trees are established, but this later slows down and trees take about 50 years to reach maturity[186]. Frequently found as a shrub in light woodland, especially under oak. It is one of the first trees to colonize chalk grassland[186]. The field maple is a bad companion plant, inhibiting the growth of nearby plants[18, 20]. A good bee plant[7]. This species has often been coppiced in the past for its wood[17]. Trees pro-

growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.319 Chenopodium foliosum

Leafy goosefoot

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Chenopodium foliosum* is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Fruit Leaves SeedEdible Uses: Leaves - cooked and used like spinach[61, 74, 177]. The raw leaves should only be eaten in small quantities, see the notes above on toxicity. Seed - ground into a powder and cooked. It can be added to cereal flours and used in making bread. Very small and fiddly, the seed is about 1mm in diameter[266]. Soak the seed for 12 hours and then thoroughly rinse it in order to wash off any saponins before grinding it[K]. Fruit - raw. Fairly insipid, though quite attractive to look at[K]. The fruit is about 12mm in diameter[200].

tcanta DyeGold/green dyes can be obtained from the whole plant[168].

dwatta None known

propta Seed - sow spring in situ. Most of the seed usually germinates within a few days of sowing.

nwatta An easily grown plant, succeeding in most soils but disliking shade[1, 200]. It prefers a moderately fertile soil[200]. Formerly cultivated for its edible leaves[61]. This species is closely related to *C. capitatum*[200].

## 5.2.320 Arisaema triphyllum

Jack In The Pulpit, Dragonroot, Indian Turnip

4 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Arisaema triphyllum* is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 4. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Tuber - it must be thoroughly dried or cooked before being eaten[2, 21, 55, 57, 95, 102]. The roots can be cut into very thin slices and allowed to dry for several months, after which they are eaten like potato chips, crumbled to make a cereal or ground into a cocoa-flavoured powder for making biscuits, cakes etc[177, 183]. They can also be pounded into a powder, this is then left to dry for several weeks when it becomes safe to use[213]. The root is up to 5cm long and 2cm wide[4]. Caution is advised, see the notes above on toxicity.

tcanta Musical StarchA starch obtained from the roots is used as a stiffener for clothes[207]. It is very harsh to the hands, causing blisters and swellings[207]. The seeds have been used in rattles[257].

dwatta Acid Antirheumatic Antiseptic Contraceptive Diaphoretic Expectorant Irritant Poultice StimulantThe root is acid, antiseptic, diaphoretic, expectorant, irritant and stimulant[21, 46, 222, 238, 257]. It is harvested in early spring and dried for later use[4]. The fresh root is considered to be too dangerous and intensely acid to use, whilst the dried roots become inactive, so fresh, partially dried roots are used[213]. Due to the potentially toxic nature of this

plant, it should only be used internally under the supervision of a qualified practitioner[K]. The root was applied as a poultice on headaches, scrofulous sores, rheumatism, boils, abscesses and ringworm[222, 257]. A decoction of the root has been used as a wash for sore eyes[257]. The root was used as a contraceptive by the N. American Indians. One teaspoonful of the dried powdered root in cold water was said to prevent conception for a week whilst two teaspoonfuls in hot water was said to induce permanent sterility[213].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Landscape Uses:Massing, Woodland garden. Prefers a cool peaty soil in the bog garden, woodland garden or a sheltered border in semi-shade[90, 134, 200]. Prefers a loamy or peaty soil and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too hot or exposed[1, 200]. Tubers should be planted about 10cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year. Special Features: Attracts birds, Attractive foliage, North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands plant.

## 5.2.321 Arctostaphylos uva

Bearberry

4 tin 8 cyuc 3 kcaak 4 tcan 4 dwat 0.1 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrisrasljut hpa7tli frusflat-prikliwis hpa7tmwatli fyfexre7t hjonli

drutta *Arctostaphylos uva-ursi* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year; in flower from April to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[3, 7, 8, 62, 161, 257]. Insipid, dry and mealy[4, 101, 183], it becomes sweeter when cooked[212]. Added to stews etc, it is a good source of carbohydrates[101]. The fruit can also be cooked and eaten. They are used for preserves or made into jelly, marmalade, sauces and pastes. The ripe fruit can be soaked in water or butter to reduce the dryness. Plants are best harvested after the first frost which sweetens them. They can be left to lie all winter under the snow [1-4]. The fruit can also be used to make a cooling drink or used for preserves etc[161, 183]. It can be dried and stored for later use[257]. The fruit is about 6mm in diameter[200]. A tea is made from the dried leaves[177, 183].

tcanta Beads Dye Pioneer Soil stabilization Tannin WaterproofingA yellowish-brown dye is obtained from the leaves[57, 101], it does not require a mordant[168]. A grey-brown dye is obtained from the fruit[257]. The dried fruits are used in rattles and as beads on necklaces etc[99, 257]. The leaves are a good source of tannin[46, 61, 212]. The mashed berries can be rubbed on the insides of coiled cedar root baskets in order to waterproof them[257]. A good ground-cover for steep sandy banks in a sunny position[188, 200] or in light shade[197]. A carpeting plant, growing fairly fast and carpeting as it spreads[208]. It is valuable for checking soil erosion on watersheds[212]. This is also a pioneer plant in the wild, often being the first plant to colonize burnt-over areas, especially on poor soils[155]. There are a num-

ber of named varieties developed for their ornamental interest[200].

dwatta Antiseptic Astringent Birthing aid Diuretic Hypnotic Kidney Lithontripic Poultice Skin Tonic Urinary Women's complaintsBearable was commonly used by many native North American Indian tribes to treat a wide range of complaints and has also been used in conventional herbal medicine for hundreds of years, it is one of the best natural urinary antiseptics[254]. The leaves contain hydroquinones and are strongly antibacterial, especially against certain organisms associated with urinary infections[238]. The plant should be used with caution, however, because hydroquinones are also toxic[222]. The leaves are antiseptic, astringent, diuretic, lithontripic, hypnotic and tonic[7, 9, 21, 102, 165, 172, 192]. The dried leaves are used in the treatment of a variety of complaints[4]. These leaves should be harvested in early autumn, only green leaves being selected, and then dried in gentle heat[4]. A tea made from the dried leaves is much used for kidney and bladder complaints and inflammations of the urinary tract such as acute and chronic cystitis and urethritis, but it should be used with caution and preferably only under the supervision of a qualified practitioner[4, 21, 46, 172, 222, 254]. The tea is more effective if the urine is alkaline, thus it is best used in combination with a vegetable-based diet[254]. Externally, a poultice of the infused leaves with oil has been used as a salve to treat rashes, skin sores etc, and as a wash for a baby's head[257]. An infusion of the leaves has been used as an eyewash, a mouth-wash for cankers and sore gums and as a poultice for back pains, rheumatism, burns etc[257]. The dried leaves have been used for smoking as an alternative to tobacco[238]. One report says that it is unclear whether this was for medicinal purposes or for the intoxicated state it could produce[192], whilst another says that the leaves were smoked to treat headaches and also as a narcotic[257]. The herb should not be prescribed to children, pregnant women or patients with kidney disease[238]. Another report says that some native North American Indian tribes used an infusion of the stems, combined with blueberry stems (*Vaccinium* spp) to prevent miscarriage without causing harm to the baby, and to speed a woman's recovery after the birth[257]. Other uses: fluid retention and bed wetting. Claimed to strengthen the heart muscle and urinary tract and to return the womb to its normal size after childbirth [301]. Treatment should be short (seven days) and used with an alkaline diet [301]. Not recommended for children under 12.

propta Seed - best sown in a greenhouse as soon as it is ripe. Pre-soak dried seed in boiling water for 10 - 20 seconds or burn some straw on top of them and then stratify at 2 - 5°C for 2 months[11, 200]. The seed usually germinates in 2 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or greenhouse for at least their first winter. Plant out in late spring or early summer. Cuttings of side shoots of the current season's growth, 5 - 8cm with a heel, August to December in a frame. The cuttings are very slow and can take a year to root[1, 78]. Division in early spring. Take care because the plant resents root disturbance. Pot the divisions up and keep them in a lightly shaded position in a cold frame or greenhouse until they are growing away actively. Layering of long branches in early spring[200, 238].

nwatta Requires a deep moist well-drained light or medium lime-free loam in sun or semi-shade[3, 11, 200]. One report says that this species succeeds in alkaline soils[182] (a rather surprising comment considering the general needs of the genus - it is more likely that the plant can grow on limestone so long as the soil remains acid[K]). Shade tolerant[31] but plants produce less fruit when they are grown in the shade[200]. Prefers a cool damp position. A very ornamental plant, it is sometimes cultivated for its medicinal uses[1]. There are a number of named varieties developed for their ornamental interest[200]. The form 'Massachusetts' is an especially prostrate, free-flowering and free-fruited form[183]. 'Anchor Bay', 'Point Reyes' and 'Vulcan's Peak' have all been mentioned as good groundcover forms[200]. This is one of the first plants to colonize bare and rocky ground and burnt over areas[155]. It is often an indicator of poor soils in the wild[212]. Plants resent root disturbance and should be placed in their final positions as soon as possible[11, 134]. Hybridizes with other members of this genus, especially *A. columbiana*. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants

withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.2.322 *Fragaria*

Strawberry, Beach strawberry, Pacific beach strawberry, Sandwich beach strawberry, Virginia strawberry  
4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmmihhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Fragaria* is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to November, and the seeds ripen from June to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[K]. A delicious flavour, the fruit is almost as large as an average cultivated strawberry but it is not very freely produced[187, K].

tcanta The plant spreads rapidly by means of runners and can be used as a ground cover[K].

dwatta None known

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. This plant is a bi-generic hybrid and will not breed true from seed. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position. Tolerates semi-shade though fruit production will be reduced. This species is a hybrid of garden origin between two species from different genera, the cultivated strawberry, *Fragaria* x *ananassa* and the marsh cinquefoil, *Potentilla palustris*. It should eventually get a Latin name that combines parts of the two generic names, but until then it is included here under *Fragaria*[K]. To date (1995) only one cultivar is available in garden centres etc. Called 'Pink Panda' it spreads very freely by means of runners, flowers heavily all through the summer, but does not produce much fruit[K].

## 5.2.323 *Hydrophyllum capitatum*

Cat's Breeches, Ballhead waterleaf, Alpine waterleaf, Thompson's waterleaf

4 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Hydrophyllum capitatum* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Tannin is obtained from the bark[46].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Prefers an acid soil[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Trees are fast growing[200], but they prefer warmer summers than are usually experienced in Britain and often grow poorly in this country[11], failing to properly ripen their wood which results in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. The seed ripens in its first year[200]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.363 *Quercus imbricaria*

Shingle Oak, Northern Laurel Oak

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 20 m hkuc  
hmmihhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Quercus imbricaria* is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed, which is up to 18mm long and wide[82, 229], contains bitter tannins - these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - hard, heavy, rather coarse grained[46, 61, 82, 171, 235]. It weighs 47lb per cubic foot[235]. It is occasionally used in construction and for making furniture, clap boards and shingles[46, 61, 82, 171].

dwatta Antiseptic Astringent Dysentery Emetic Febrifuge TonicAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. The bark is antiseptic, astringent, emetic, febrifuge and tonic[257]. It has been used in the treatment of chronic dysentery, indigestion, asthma and intermittent fevers[257]. The bark has been chewed in the treatment of mouth sores[257]. An infusion of the bark has been used as a wash for sore and chapped skin[257].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Firewood, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Closely related to *Q. phellos*[1]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms.

## 5.2.364 *Quercus pubescens*

Downy Oak

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 20 m hkuc  
hmmihhtut cyutli kyuctcup hwicli jlutnyikrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Quercus pubescens* is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. A famine food, used when all else fails[177]. The seed is up to 2cm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - hard, durable even under water, not very elastic. Used for furniture etc[46, 61].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment

hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in May, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Inner bark Seed**Edible Uses:** TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw. Too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

**tcanta Resin Tannin WoodTannin** is obtained from the bark[74]. Turpentine is obtained from the bark and branches[74]. Wood - soft, white, easily cleaves, light, durable, has a good resonance. Used for construction, furniture etc[74]. It is also valued for its use in the pulp industry to make paper[171].

**dwatta Vitamin C**None known

**propta Seed** - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

**nwatta Landscape Uses:**Pest tolerant, Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. There are a number of named forms selected for their ornamental value, most of these are dwarf cultivars[200]. Young trees are slow growing at first but from the age of about 5 - 6 years they can grow up to 1 metre a year and this can be maintained for the next 70 years or so. Growth virtually ceases by the time the tree is 90 - 100 years old[185]. Increases in girth follow the same pattern as height increases[185]. Trees probably do not live much longer than 100 years in Britain[185]. They are occasionally planted on a small scale in Europe as a timber tree[50]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. The bruised leaves have a resinous aroma[245]. **Special Features:** Not North American native, Inconspicuous flowers or blooms.

### 5.2.361 *Fagus orientalis*

Oriental Beech

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 20 m hkuc pcmhmmhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli hjonli

**drutta** *Fagus orientalis* is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost

tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Leaves Oil Seed**Edible Uses:** Coffee OilYoung leaves - raw. A very nice mild flavour, but the leaves quickly become tough so only the youngest should be used. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Seed - raw or cooked. Rich in oil. The seed should not be eaten raw in large quantities. It can be dried and ground into a powder and then used with cereal flours when making bread, cakes etc. An edible semi-drying oil is obtained from the seed[105, 177, 183].

**tcanta Oil**None known

**dwatta** None known

**propta Seed** - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

**nwatta** Thrives on a light or medium soil, doing well on chalk, but ill-adapted for heavy wet soil[1, 11]. Fairly tolerant of most conditions, this is the most successful non-native species of *Fagus* in Britain[200]. Young trees are very shade tolerant, but are subject to frost damage so are best grown in a woodland position which will protect them[200]. Hybridizes in nature with *F. sylvatica*[11]. Large mature trees at Kew produced a very good crop of seed in 1999[K]. Trees have surface-feeding roots and also cast a dense shade. This greatly inhibits the growth of other plants and, especially where a number of the trees are growing together, the ground beneath them is often almost devoid of vegetation.

### 5.2.362 *Quercus dentata*

Japanese Emperor Oak, Daimyo oak

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 20 m hkuc hmimhmtut cyutli tcup hwicli jltutnyik hpa7tli flatprk hpa7tmwatli hjonli

**drutta** *Quercus dentata* is a deciduous Tree growing to 20 m (65ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Seed**Edible Uses:** CoffeeSeed - cooked[105, 177]. The seed is up to 23mm long and 15mm wide[266]. Rich in starch[105]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[177].

**kcakta Edible Parts:** Leaves Root**Edible Uses:** Tender young shoots - cooked as a potherb[207, 212]. Root - cooked[207]. Large and fleshy[212].

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in a cold frame. The seed usually germinates in early spring. Sow stored seed as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** Requires a moist humus-rich soil in semi-shade[200]. Grows well in an open woodland garden[200]. The leaves are shaped in such a way that they collect rainwater in a cavity[212]. Slugs are particularly fond of this plant and will soon destroy it if given a chance[K].

### 5.2.324 *Allium suaveolens*

4 tlin 8 cyuc 3 kcak 0 tcan 2 dwat 0.5 m hkuc hmimhmtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

**drutta** *Allium suaveolens* is an evergreen Bulb growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Root**Edible Uses:** Bulb - raw or cooked. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

**tcanta Repellent**The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

**dwatta** Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

**propta Seed** - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

**nwatta** An easily grown plant[203], it prefers a sunny position in a light well-drained soil[1]. Succeeds in heavy soils and in light shade[203]. The bulbs should be planted fairly deeply[1]. Closely related to *A. senescens*, differing mainly in having leaved leaves[203]. It has the same uses as that species[K]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.325 *Claytonia tuberosa*

Tuberous Spring Beauty

4 tlin 8 cyuc 3 kcak 0 tcan 0 dwat 0.2 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flat hpa7tmwatli xre7t hjonli

**drutta** *Claytonia tuberosa* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy

to UK zone 4. It is in flower from April to July, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves Root**Edible Uses:** Root - raw or cooked[2, 74, 85, 153, 172]. It can be added to soups and stews[257]. It is rather small[172]. Leaves - raw or cooked[172]. A source of vitamins A and C, the leaves can be used as greens[257]. Flowers - raw[172].

**tcanta** None known

**dwatta** None known

**propta Seed** - surface sow on a peat based compost in spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 10°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Division of offsets in spring or autumn.

**nwatta** Prefers a damp peaty soil and a position in full sun[1, 164]. Requires a lime-free soil[164].

### 5.2.326 *Triteleia hyacinthina*

Hyacinth Brodiaea, White brodiaea

4 tlin 8 cyuc 3 kcak 0 tcan 0 dwat 0.7 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

**drutta** *Triteleia hyacinthina* is a BULB growing to 0.7 m (2ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Root**Edible Uses:** Bulb - raw or cooked[105, 161, 212, 257]. Rich in starch, the bulb can be used like potatoes[257]. An emergency food, it is only used when all else fails[177].

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in a cold frame. Alternatively, the seed can be sown in spring in a cold frame. Germination usually takes place within 1 - 3 months at 15°C. Sow the seed thinly so that there is no need to prick them out and grow the seedlings on in the pot for their first year. Give an occasional liquid feed to ensure that they do not become mineral deficient. Seedlings are prone to damping off so be careful not to overwater them and keep them well ventilated. When they become dormant, pot up the small bulbs placing about 3 in each pot. Grow them on in the greenhouse for another year or two until the bulbs are about 20mm in diameter and then plant them out into their permanent positions when they are dormant in the autumn. Division of flowering size bulbs in autumn. Dig up the clumps of bulbs, replanting the larger ones direct into their permanent positions. It is best to pot up the smaller ones and grow them on in a greenhouse for a year before planting them out when they are dormant in early autumn.

**nwatta** Requires a rich well-drained sandy loam[1]. Likes plenty of moisture whilst in growth followed by a warm dry period in late summer and autumn[200]. Succeeds outdoors in a very sheltered warm position, otherwise it is best grown in a bulb frame[90]. There are two basic forms of this species, a large white-flowered form grows wild in wet places whilst a smaller form is found on drier slopes[90]. The hardiness zone has been given as 4, this is somewhat questionable, the plant is liable to be much less hardy[K].

### 5.2.327 *Erythronium albidum*

White Trout-Lily, White fawnlily

4 tlin 8 cyuc 3 kcak 0 tcan 0 dwat 0.1 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

**drutta** *Erythronium albidum* is a BULB growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy

to UK zone 4 and is not frost tender. It is in flower from March to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves **Root****Edible Uses:** Bulb - raw or cooked[105, 161]. A delicious flavour[183]. Rather small, it is about 25mm long[235]. Young leaves - raw or cooked. Crisp, tasty, tender and mild when eaten raw[183]. Eating the leaves will greatly reduce the vigour of the bulb, so can only be recommended in times of emergency[K]. Flowers, flower buds and flower stems - raw or cooked[183].

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division in summer as the leaves die down. This species does not produce offsets[200].

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils so long as they contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. This species is closely related to *E. americanum*[235], but is unsatisfactory in cultivation outdoors in Britain[90]. It comes into growth early in the year and the flowers probably need more heat than is available in this country if they are to open properly[90]. A clump seen growing in light shade at Kew early in April 1995 was growing vigorously, spreading well and had lots of flower buds, but was not yet in flower[K]. Erythronium albidum often forms extensive colonies in which nonflowering, 1-leaved plants far outnumber flowering, 2-leaved ones[270]. Flowers are produced in 3 - 4 years from seed[164]. This species does not produce offsets[200].

### 5.2.328 Ligusticum scoticum

Scottish Lovage, Scottish licorice-root, Hulten's licorice-root 4 tlin 8 cyuc 3 kcak 2 tcan 2 dwat 0.6 m hkuc htuc cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwisp hpa7tmwatli fyfxre7t hjonli

drutta Ligusticum scoticum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Leaves **Root** **Seed** **Stem****Edible Uses:** CondimentLeaves, flowers and young shoots - raw or cooked[2, 4, 5, 100]. Strong and not very pleasant[115]. Superb in salads[172]. The leaves are usually blanched in order to make the flavour milder[61, 183], though this also reduces the nutritional value[K]. A celery-like flavour, it is used as a seasoning in salads, soups etc[183]. Another report says that the flavour is more like parsley[245]. Stem - used as a flavouring in soups, stews etc[5, 17]. A celery-like flavour[238]. The green stem is peeled and eaten[183]. Root - raw or cooked[2, 5, 161]. A sweet flavour[161]. Seed - grown into a powder and used as a flavouring in soups and stews[172, 238, 245]. A sharp, hot taste it is used in the same ways as pepper[245]. The young shoots and roots are occasionally candied like angelica[183].

tcanta DeodorantScented. Deodorant.

dwatta Aromatic Carminative Deodorant StimulantThe root is aromatic and carminative[4]. It is used in the treatment of hysterical and uterine disorders[4, 238]. The seeds are sweetly aromatic and have been used as a carminative, deodorant and stimulant[4, 172, 238]. They are also sometimes used for flavouring other herbal remedies[4].

propta Seed - the seed only has a short period of viability and so is best sown as soon as it is ripe in a cold frame in the autumn. Stored seed should be sown as early in the year as possible in a greenhouse or cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer if they have grown large enough. Otherwise, keep them in a cold frame for the first winter and plant them out in early summer. Division of the rootstock in early spring. Make sure that each section of root has at least one growth bud. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any well-drained soil in a sunny position[1, 200]. Dislikes shade. Succeeds in dry soils[238]. Plants are hardy to at least -15°c[238]. Scottish lovage has occasionally been cultivated as a pot herb, though it has been largely supplanted by celery[1, 4, 17]. All parts of the plant are aromatic when bruised, the aroma being likened to a mixture of parsley, angelica and pear skin[245]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.329 Armoracia rusticana

Horseradish, Red Cole

4 tlin 9 cyuc 3 kcak 2 tcan 3 dwat 0.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli fyfxre7t hjonli

drutta Armoracia rusticana is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves **Root** **Seed****Edible Uses:** CondimentYoung root - raw or cooked. The grated root is used to make the condiment ‘Horseradish sauce’[2, 9, 13, 14, 27, 33, 34, 52], this has a hot mustard-like flavour[100]. The sauce is best used uncooked or gently warmed, heating it will destroy the volatile oils that are responsible for its pungency[238]. It is said that in Germany the roots are sliced and cooked like parsnips[183] - rather than me![K]. The root is a rich source of sulphur[201]. Fresh roots contain the glycoside sinigrin - this is decomposed in the presence of water by the enzyme myrosin, producing mustard oil which gives the root its hot flavour[268]. The fleshy roots can be up to 60cm long and 5cm thick[268]. The plant is fully hardy and can be left in the ground all winter to be harvested as required[4]. Alternatively, the roots can be harvested in early winter and stored for later use, they will retain their juicy state for some time if stored in dry sand[4]. Young leaves - raw or cooked[2, 9, 14, 177]. A very strong flavour, though nice when added in small quantities to the salad bowl[183, K]. A pleasant mild flavour according to another report[238]. Seeds - sprouted and eaten in salads[183].

tcanta Fungicide RepellentHorseradish tea is effective against brown rot of apples and other fungicidal diseases[18, 201]. The growing plant deters potato eelworm[14].

dwatta Antibacterial Antirheumatic Antiseptic Aperient Digestive Diuretic Expectorant Rubefacient Stimulant UrinaryHorseradish is a very pungent stimulant herb that controls bacterial infections and can be used both internally and externally[238]. The plant is a powerful stimulant, whether

Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A moderately fast-growing tree in the wild[229]. Seed production is cyclic, with a year of high yields being followed by 2 - 3 years of low yields[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Hybridizes in the wild with *Q. velutina*[43]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. **Special Features:**North American native, Inconspicuous flowers or blooms.

### 5.2.358 Vitis coignetiae

Crimson Glory Vine

4 tlin 8 cyuc 2 kcak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis coignetiae is a deciduous Climber growing to 20 m (65ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Fruit Leaves **Stem****Edible Uses:** Fruit - raw or dried for winter use[105, 177, 183]. The fruit is about 12mm in diameter and is carried in bunches, but it is scarcely edible[200]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked. Young stems and leafstalks - boiled[105, 177, 183].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168]. Plants can be used as a ground cover in a sunny position[188]. They are best spaced about 3.5 metres apart each way[208]. They can be encouraged to cover the ground by laying brushwood flat on the ground and pegged into position. The twigs would eventually rot and the plant would assume complete and constant control[208].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/january in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Cuttings are difficult from this species[219]. Layering. This is the best method for this species[219].

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The fully dormant plant is hardy to about -25°c, though the young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. A fast growing climber[11, 202], attaching itself by means of tendrils[182], it is ideal for growing into large trees. Plants are often slow to establish, taking 1 - 2 years from planting out before they make much new growth[202]. A very ornamental plant[1] with its large leaves

which colour well in the autumm. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.359 Quercus aliena

Oriental White Oak

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus aliena is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Seed**Edible Uses:** CoffeeSeed - cooked[105, 177]. The seed is about 25mm long, it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood. Of local value, it is used mainly for boat building[61].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. The seed ripens in its first year[200]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.360 Picea orientalis

Caucasian Spruce

4 tlin 7 cyuc 2 kcak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Picea orientalis is an evergreen Tree growing to 20 m (65ft) by 5 m (16ft) at a fast rate. See above for USDA

and is easily harvested[K]. It is quite rich in saponins and needs to be leached of these toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days. By this time most of the minerals etc would also have been leached out[K].

tcanta Miscellany Soap WoodSaponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Wood - close-grained, light, soft, white, but often bleached by dark lines of decay[82, 229]. It weighs 28lb per cubic foot[235]. It is easy to carve and resists splitting. Ideal to use in making artificial limbs, it is also used for woodenware, pulp etc and is occasionally sawn into lumber[82, 229, 235].

dwatta Antispasmodic MiscellanyMinute doses of the seed are used internally in the treatment of spasmodic coughs, asthma and internal irritations[222]. It is used externally as a tea or an ointment in the treatment of rheumatism and piles[222]. An extract of the bark has been used as an irritant of the cerebro-spinal system[82].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Landscape Uses:Specimen, Street tree. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. This species is the state tree of Ohio[229]. Its growth-rate is moderate in the wild, with trees living up to 100 years[229]. In Britain, it grows best in eastern and south-eastern areas of England probably needing a continental climate in order to thrive[126, 200]. Although the trees are hardy when dormant, the new growth can be damaged by late spring frosts[11]. The twigs, bark, flowers and leaves all produce a foetid odour if crushed[229]. Most members of this genus transplant easily, even when fairly large[11]. Special Features:Attractive foliage, North American native, Fragrant foliage, All or parts of this plant are poisonous, Blooms are very showy.

### 5.2.356 Vitis palmata

Red Grape, Catbird grape

4 tin 8 cyuc 2 kcak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Vitis palmata is a deciduous Climber growing to 20 m (65ft 7in). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[159, 177]. A sweet flavour when mature[274]. The fruit is up to 10mm in diameter and is carried in small bunches[235]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour[159]. Young tendrils - raw or cooked. Used as a snack[159].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large

enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.357 Quercus ellipsoidalis

Northern Pin Oak

4 tin 6 cyuc 2 kcak 0 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Quercus ellipsoidalis is a deciduous Tree growing to 20 m (65ft) by 13 m (42ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed, which is up to 2cm long[229], contains bitter tannins - these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[161, 177, 257].

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - hard, heavy strong. It is cut occasionally for lumber, being used for flooring, furniture and interior finishes[229].

dwatta Astringent Dysentery EmmenagogueAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. A decoction of the inner bark has been used to treat suppressed menses caused by cold[257].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11].

used internally as a spur for the digestive system or externally as a rubefacient[4]. It should not be used internally by people with stomach ulcers or thyroid problems[238]. The roots are antiseptic, aperient, digestive, diuretic, expectorant, rubefacient and stimulant[4, 13, 14, 165, 171, 222]. They should be used in their fresh state[4]. An infusion is used in the treatment of colds, fevers and flu and is of value in the treatment of respiratory and urinary tract infections[254]. A sandwich of the freshly grated root is a traditional remedy for hay fever[254]. A tea made from the root is weakly diuretic, antiseptic and expectorant[222]. The plant is antibiotic against gram-negative and gram-positive bacteria and also pathogenic fungi[222, 240]. It is experimentally antitumor[222]. Externally, a poultice made from the roots is used to treat pleurisy, arthritis and infected wounds[238]. It will also relieve the pain of chilblains[244]. Some caution should be employed, however, because it can cause blistering[254]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Armoracia rusticana* for internal and external use in catarrhs of the respiratory tract, internally as supportive therapy for urinary tract infections, externally for the hyperaemic treatment of minor muscles aches (see [302] for critics of commission E).

propta Seed - this is seldom produced on plants in cultivation[200]. If seed is obtained then it is best sown in situ during the spring[238]. Division is very easy and can be carried out at almost any time of the year, though it is probably best in spring[33]. It s best to use sections of root about 20cm long, which can be planted out into their permanent positions in February or March, though even very small bits of root will grow away[4, 264]. Division should be carried out at least once every three years or the crop will deteriorate[4].

nwatta Landscape Uses:Massing, Seashore. A very easily grown plant, horseradish prefers a good deep moist well-drained soil and a sunny position[16, 27, 33, 200]. Plants require a good soil if they are to produce good roots[4], though once established they are very tolerant of neglect and will continue to produce a crop for many years[264, K]. Plants do not thrive if they are in the shade of trees[264]. Excess nitrogen causes heavy top growth and forking of the roots[200]. Prefers a wet clay soil according to one report[14], whilst another says that it will not grow in wet soil[16]. Tolerates a pH in the range 5.8 to 8.3. Horseradish has long been cultivated for its root which is used as a food flavouring and medicinally, there are some named varieties[4, 17, 61, 183]. If the roots are given some protection they will produce fresh young leaves for the salad bowl all through the winter. Digging up some roots and putting them into a greenhouse for the winter is the easiest method. If the young shoots are blanched they will produce white, tender, sweet leaves[183]. A very invasive plant[33], it is considered to be a pernicious weed in some areas[200]. Even quite small sections of root will regrow if they are left in the soil[4]. The plant has yet to prove invasive on our Cornwall trial grounds, though it has survived and even prospered in a very overgrown site[K]. The forms of this plant grown in gardens are almost sterile and seldom produce good seed[264]. This is a good companion plant for potatoes since it is said to deter potato eelworm[14, 18, 201] and the Colorado beetle[238]. One plant at each corner of the potato patch is quite sufficient[201]. When grown under apple trees it is said to prevent brown rot, powdery mildew and other fungal diseases[201].Special Features:Fragrant foliage, Not North American native, Invasive, Naturalizing, Fragrant flowers. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.330 Erythronium revolutum

Pink Fawn Lily, Mahogany fawnlily

4 tin 8 cyuc 3 kcak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium revolutum is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[256]. It can also be dried and stored for later use[257]. The bulbs are usually harvested in the spring as the first leaves appear above ground, they can be stored for some months in a cool place[256]. The raw bulb has a slightly bitter milky taste, the texture is cool and moist inside and so the North American Indians liked eating them on hot days[256]. The cooked bulb has a more starchy texture. The Indians always drank water after eating the bulbs because they believed that otherwise they would get sick[256]. The ovoid bulb is 35 - 50mm long[270].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Plants are hardy to about -15°C[90]. The sub-species *E. revolutum johnstonii* is growing well, flowering freely and spreading nicely in the dappled shade of a woodland garden at Kew[K]. It does not, however, produce new bulbs freely by division, relying instead upon self-sown seedlings[258]. There are a number of named garden forms, 'Pink Beauty' has been specially mentioned as easy to grow in Britain[200]. Flowers are produced in 3 - 4 years from seed[164]. Bulbs should be planted about 7cm deep[1].

### 5.2.331 Physalis pruinosa

Strawberry Tomato

4 tin 8 cyuc 3 kcak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Physalis pruinosa is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, preserves etc[105]. A delicious bitter sweet flavour. The plant conveniently wraps up each fruit in its own 'paper bag' (botanically, the calyx) to protect it from

pests and the elements. This calyx is toxic and should not be eaten.

tcanta None known

dwatta None known

propta Seed - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out after the last expected frosts. Consider giving them some protection such as a cloche until they are growing away well. Diurnal temperature fluctuations assist germination[170].

nwatta Succeeds in any well-drained soil in full sun or light shade[200]. The young growth in spring can be damaged by late frosts. Occasionally cultivated for its edible fruit, there are some named varieties. Similar to *P. peruviana*[200].

## 5.2.332 *Prunus japonica nakai*

Japanese Plum

4 tin 8 cyuc 3 kcaak 1 tcan 3 dwat 0.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Prunus japonica nakai* is an evergreen Shrub growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked. A sweet agreeable flavour; they make a good pie[183]. A very good size, about 50mm in diameter with one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta DyeA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Aperient Aphrodisiac Carminative Demulcent Deobstruent Diuretic Lenitive OphthalmicThe kernels are aperient, carminative, demulcent, deobstruent, diuretic, lenitive and ophthalmic[147, 176, 178, 218, 279]. Their use lowers the blood pressure[176]. A decoction is used in the treatment of sluggish colon, constipation, oedema and inadequate elimination of urine[147]. The pits of this subspecies are aphrodisiac for both sexes[218]. The root is used in the treatment of constipation, children's fever, pinworms and teeth ailments[218]. All members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. A very ornamental plant[1], but it is subject to die-back[11]. Plants in this genus are notably susceptible to honey fungus[200]. This sub-species has larger plum-like fruits up to 50mm in diameter[200]. Closely related to *P. glandulosa*[11, 58]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown

above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.2.333 *Tussilago farfara*

Coltsfoot

4 tin 8 cyuc 3 kcaak 3 tcan 3 dwat 0.2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikli-wisslip hpa7tmwatli yfifxre7t hjonli

drutta *Tussilago farfara* is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from February to April, and the seeds ripen from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves OilEdible Uses: Oil Salt TeaFlower buds and young flowers - raw or cooked[46, 183]. A pleasant aniseed flavour[K], they add a distinctive aromatic flavour to salads[9]. Young leaves - raw or cooked[9, 46, 183]. They can be used in salads, added to soups, or cooked as a vegetable[238]. The leaves have a bitter taste unless they are washed after being boiled[179]. An aromatic tea is made from the fresh or dried leaves and flowers[183]. It has a liquorice-like flavour[238]. The dried and burnt leaves are used as a salt substitute[102, 183]. The slender rootstock is candied in sugar syrup[183].

tcanta Compost Oil Soil stabilization Stuffing TinderThe soft down on the underside of the leaves is used as a stuffing material[53, 54]. When wrapped in a rag, dipped in salt-petre and dried in the sun it makes an excellent tinder[4]. Plants have an extensive root system and are used to stabilize banks[200]. The leaves are a valuable addition to the compost heap[200].

dwatta Antitussive Astringent Bitter Demulcent Diaphoretic Eczema Emollient Expectorant Skin Stimulant TonicAn effective demulcent and expectorant herb, coltsfoot is one of the most popular European remedies for the treatment of a wide range of chest complaints[254]. It is widely available in health food shops. The leaves are commonly used in Europe, though the flowering stems (which contain higher levels of pyrrolizidine alkaloids) are preferred in China[254]. They are rich in mucilage and are the main parts used, though the root is also sometimes employed[4, 244]. Pyrrolizidine alkaloids have a toxic effect upon the liver, but are largely destroyed when the plant is boiled to make a decoction[254]. Some caution should be employed in the use of this remedy - the flowers should not be used except under professional supervision, the leaves should not be used for more than 4 - 6 weeks at a time, the herb should not be taken whilst pregnant or breast-feeding and it should not be given to children under the age of six[254]. Modern research has shown that extracts of the whole plant can increase immune resistance[254]. In a Chinese trial 75% of patients suffering from bronchial asthma showed some improvement after treatment with this plant, though the anti-asthmatic effect was short-lived[254]. The leaves are harvested in June and early July, the flowers are harvested when fully open and the root is harvested in the autumn. All can be dried and used as required[4]. The plant is antitussive, astringent, demulcent, emollient, expectorant, stimulant and tonic. It is widely used in the treatment of coughs and respiratory problems[4, 7, 9, 13, 21, 54, 165, 176, 218] and is often candied so that it can be sucked as a sweet[4]. The plant is of particular use in the treatment of chronic emphysema and silicosis, helping to relieve the persistent cough associated with these conditions[244]. Coltsfoot is particularly effective when used in combination with liquorice (*Glycyrrhiza* species), thyme (*Thymus vulgaris*) and wild cherry (*Prunus serotina*)[254]. A poultice of the flowers has a soothing effect on a range of skin disorders including eczema, ulcers, sores, bites and inflammations[7, 238]. A bitter, tonic and diaphoretic preparation can be obtained from the root[7].

young plants, can die back over winter if they are not fully ripened[11]. Young plants are slow-growing[200]. The tree is widely cultivated for timber in China[266]. A polymorphic species[11].

## 5.2.353 *Picea omorika*

Serbian Spruce

4 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 25 m hkuc

htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikli-wisslip hpa7tmwatli hjonli

drutta *Picea omorika* is an evergreen Tree growing to 25 m (82ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw. Too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta Shelterbelt WoodModerately wind resistant, it is sometimes planted in shelterbelts. Wood. It is valued for its use in the pulp industry to make paper[171].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Pest tolerant, Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6 but it also succeeds in pure chalk soils[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. There are a number of named forms selected for their ornamental value, most of these are dwarf cultivars[200]. A fast growing tree from its second year of growth. Two to three years after planting out new shoots 1 metre long may be produced[185]. Growth takes place from mid-May to the end of July. Height increase is moderate over a long term basis, averaging around 50cm a year[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Occasionally planted as a timber tree in Britain, it produces almost the same bulk of timber as the Norway spruce (*Picea abies*) but

is more frost tolerant and can be grown in frosty hollows[185] because it comes into leaf quite late and it is not damaged by late frosts[11]. This species is widely cultivated as a timber tree in regions too dry or liable to late frosts for *P. sitchensis* to do well[200]. This species is notably susceptible to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 5.2.354 *Fagus japonica*

Japanese Beech

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 22 m hkuc

pcimhmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta *Fagus japonica* is a deciduous Tree growing to 22 m (72ft 2in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Coffee OilYoung leaves - raw. A very nice mild flavour; but the leaves quickly become tough so only the youngest should be used. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Edible seed - raw or cooked. Rich in oil. The raw seed should not be eaten in large quantities, see the notes above on toxicity. It can be dried and ground into a powder. An edible semi-drying oil is obtained from the seed[105, 177]. The roasted seed is a coffee substitute.

tcanta OilNone known

dwatta None known

propta Seed - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

nwatta Thrives on a light or medium soil[11], doing well on chalk[1], but ill-adapted for heavy wet soils[1]. Young trees are very shade tolerant, but are subject to frost damage so are best grown in a woodland position which will protect them[200]. Although very cold hardy, this species requires hotter summers than are normally experienced in Britain so is not usually a success here and is very slow growing[200]. Trees have surface-feeding roots and also cast a dense shade. This greatly inhibits the growth of other plants and, especially where a number of the trees are growing together, the ground beneath them is often almost devoid of vegetation.

## 5.2.355 *Aesculus glabra*

Ohio Buckeye, Fetid Buckeye

4 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 20 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Aesculus glabra* is a deciduous Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[222]. It can be dried, ground into a flour and used as a gruel. The seed is quite large, up to 35mm in diameter[82],



## 5.2.350 Quercus coccinea

Scarlet Oak

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 25 m hkuc  
hmmihmtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus coccinea is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed, which is up to 25mm long and 15mm wide[82, 229], contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - strong, hard, heavy, coarse grained[46, 82, 171, 229]. It weighs 46lb per cubic foot[235]. Inferior to wood from the white oaks, it is used in construction, furniture etc[46, 82, 171, 229].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Aggressive surface roots possible, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A very ornamental tree[1], it is fast-growing but short-lived in the wild[229]. Seed production is cyclic, a year of high yields being followed by 3 - 4 years of low yields[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

## 5.2.351 Corylus x vilmorinii

Chinese Trazel

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 25 m hkuc

hmmihmtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli hjonli

drutta Corylus x vilmorinii is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 5. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[177]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta OilNone known

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. This species is a hybrid and will not breed true from seed. Layering in autumn. Easy, it takes about 6 months[78, 200].

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wild tolerant[1, 11]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. This species is an artificial hybrid, produced by crossing *C. chinensis* x *C. avellana*. The Chinese parent contributes a characteristic rounded nut with a slightly thinner shell than *C. colurna*.

## 5.2.352 Kalopanax septemlobus

Tree Aralia, Castor aralia

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 25 m hkuc  
hmmihmtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Kalopanax septemlobus is a deciduous Tree growing to 25 m (82ft 0in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and young shoots - cooked[177, 179].

tcanta InsecticideThe bark and the leaves are used as an insecticide[178]. Wood[266].

dwatta Antifungal Expectorant Hepatic Skin Stomachic-The bark contains a range of bio-active constituents, including saponins, flavonoids and lignans[279]. It has antifungal and liver protecting properties[279]. It is used in Korea in the treatment of contusions, beri-beri, lumbago, neuralgia and pleurisy[279]. An infusion of the leaves is used to make a stomachic tea[218]. The root is expectorant[218]. A decoction of the wood is used for skin diseases[178, 218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. Stored seed probably requires a period of cold stratification and should be sown as soon as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[200]. Root cuttings in late winter.

nwatta Requires a deep fertile moisture-retentive soil in sun or part shade[200]. Young shoots, especially on

propta Seed - the plant does not usually require help with spreading itself around, but if required the seed can be sown in situ in early spring or autumn. Division of the roots is very easy and succeeds at almost any time in the year. The divisions can be planted out direct into their permanent positions.

nwatta A very easily grown plant, it succeeds in most soils when grown in full sun[14]. It prefers a moist neutral to alkaline soil and will also succeed in partial shade[238]. Plants are hardy to about -29°C[238]. Footroot is a very tough plant that is more than capable of looking after itself. When well sited its roots will spread very freely sending up new shoots at some distance from the clump even if growing amongst dense weed competition[K]. This can make it a problem weed in gardens[200], so either choose your site with care or find some means of restraining it such as by planting in a large tub that is buried in the ground[K]. The rhizomes can lay dormant in the soil for many years, emerging when the soil is disturbed[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 5.2.334 Callirhoe involucrata

Poppy Mallow, Purple poppymallow, Winecup, Finger Poppy Mallow

4 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 0.2 m hkuc  
htut cyutli hgatyuctcup hwicli hyishras hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Callirhoe involucrata is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[2, 105, 161, 177]. The root is long and tapering[2], it is sweet and starchy with a pleasant taste somewhat like that of a sweet potato[183]. Leaves - cooked. A pleasant flavour with a mucilaginous texture, they are good for thickening soups[183].

tcanta None known

dwatta AnodyneA decoction of the root is used to treat internal pain[61, 222, 257]. The root was also dried, then burnt and the smoke either inhaled or allowed to bathe the affected part of the body[222, 257].

propta Seed - sow outdoors or in a cold frame. Plants resent root disturbance so the seed is best sown in situ in April[138], though the slugs will have a field day if you do not protect the plants[K]. If seed is in short supply then sow it in pots in a cold frame, putting a few seeds in each pot, and plant the pots out in early summer once the plants have put on at least 15cm of growth. Germination usually takes place within 1 - 6 months at 15°C[138]. Cuttings of young basal shoots in a frame in sand[1, 200]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division[200]. With care since the plant resents root disturbance. We have found that it is best not to disturb this plant and so do not try to divide it, relying instead on taking basal cuttings since these do not disturb the main clump[K].

nwatta Landscape Uses: Border, Ground cover, Rock garden. Prefers a light rich sandy loam and a sunny position[1, 200]. Likes a hot dry position[200], growing well on a dry sunny bank[260]. This species is hardy to about -15°C[200]. A deep-rooting plant[235], it strongly resents root disturbance and should be planted into its final position as soon as possible[138]. Slugs are strongly attracted to this plant and can destroy even established plants by eating out all the young shoots in spring[K]. Special Features: North American native, Naturalizing, Extended bloom season in Zones 9A and above. The plant is heat tolerant in zones

7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.335 Monarda didyma

Bergamot, Scarlet beebalm, Horsemint, Oswego Tea, Bee Balm

4 tin 10 cyuc 3 kcaak 3 tcan 2 dwat 0.9 m hkuc

hmmihmtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfkrre7t hjonli

drutta Monarda didyma is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from April to October, in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves ShootsEdible Uses: Condiment TeaLeaves and young shoot tips - raw or cooked. They are used as a flavouring in salads, fruit salads, drinks etc[46, 61, 105, 183]. Flowers - raw. They are added as an attractive garnish to salads[183, 238, 244]. An excellent aromatic tea is made from the fresh or dried leaves and flower heads[21, 46, 105, 183]. The leaves give an Earl Grey flavour to China tea[238].

tcanta Companion Essential Pot-pourriLandscape Uses: Border, Container, Massing, Rock garden, Specimen. Attracts birds, North American native, Edible, Fragrant foliage, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers. Yields an essential oil, used in perfumery, as a hair tonic etc[46, 61]. The dried leaves and flowers are used to scent and add colour to pot-pourri[238]. Brings hummingbirds.

dwatta Anthelmintic Carminative Diuretic Expectorant Febrifuge Rubefacient Stimulant UrinaryBergamot is often used as a domestic medicine, being particularly useful in the treatment of digestive disorders. The leaves and flowering stems are anthelmintic, carminative, diuretic, expectorant, febrifuge, rubefacient and stimulant[4, 222]. An infusion is used in the treatment of flatulent colic and sickness, it is also used as a diuretic to treat urinary disorders[4, 238]. The leaves can be harvested before the plant flowers, or they can be harvested with the flowering stems. They can be used fresh or dried[238]. An essential oil from the herb is mainly used externally as a rubefacient in the treatment of rheumatism etc[4].

propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°C. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in ordinary garden soil so long as it is not too dry[1, 200]. Grows well in heavy clay soils. Requires a moist soil and a sunny position[4, 200]. Prefers some shade[4] but succeeds in a sunny position so long as the soil does not dry out. Provide light shade in hotter zones. Plants are hardy to at least -25°c[187]. The flowers are rich in nectar and are very attractive to bees[4, 55, 244]. A good companion plant, it grows well with tomatoes[14, 20]. Bergamot is a very ornamental and aromatic plant, it is often grown in the herb garden, there are some named varieties[183, 233]. The leaves, stems and roots carry a delicious aromatic orange-like perfume when crushed[245]. Plants are subject to mildew in dry summers[200]. Special Features: The plant is heat tolerant in zones 10 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.336 Hydrophyllum virginianum

Virginia Waterleaf, Eastern waterleaf  
4 tin 8 cyuc 3 ckak 0 tcan 1 dwat 0.6 m hkuc  
hmim cyutli tcup hwicli hrasjltunyk hpa7tli flatprikhlwis hpa7tmwatli xre7t hjonli

drutta Hydrophyllum virginianum is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

ckakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 61]. A bland flavour[159]. The mild-tasting and tender young leaves make a pleasant addition to the salad bowl[183, K], whilst older leaves make a good spinach[183]. Only use when young, they become bitter with age[159].

tcanta None known

dwatta Astringent DysenteryA tea made from the roots is astringent, it is used in the treatment of diarrhoea, dysentery etc[222]. A decoction, or the chewed root, has been used as a wash for cracked lips and sore mouths[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed usually germinates in early spring. Sow stored seed as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a moist humus-rich soil in semi-shade[200]. Slugs are particularly fond of this plant and will soon destroy it if given a chance[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 5.2.337 Mentha arvensis piperascens

Japanese Mint

4 tin 8 cyuc 3 ckak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltunykfrip hpa7tli flatprikhlwis hpa7tmwatli xre7t hjonli

drutta Mentha arvensis piperascens is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: LeavesEdible Uses: Conditment TeaLeaves - raw or cooked. Used as a flavouring in salads or cooked foods[5, 172, 183], they have a strong taste of peppermint[238]. A herb tea is made from the fresh or dried leaves[21, 183]. An essential oil from the plant is used as a flavouring in sweets and beverages[183]. The leaves contain about 0.2% essential oil[218].

tcanta Essential Repellent StrewingThe plant is used as an insect repellent[18, 20, 99]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. An essential oil is obtained from the plant[238]. It can be used as a substitute for, or adulterant of, peppermint oil[238]. Yields of up to 1.6% have been obtained[240].

dwatta Anaesthetic Antiphlogistic Antispasmodic Antispasmodic Aromatic Cancer Carminative Diaphoretic Emmenagogue Febrifuge Galactofuge Salve Stimulant Stomachic-Japanese mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its essential oil[279] which has antiseptic properties and a beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. The whole plant is anaesthetic, antiphlogistic, antispasmodic, antiseptic, aromatic, carminative, diaphoretic, emmenagogue, galactofuge, refrigerant, stimulant, stomachic and vasodilator[147, 172, 218, 279]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222,279]. The leaves are a classical remedy for stomach cancer[218]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta An easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. This species tolerates much drier conditions than other members of the genus[238]. Prefers a slightly acid soil[16]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Plants are hardy to at least -15°c[238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. The whole plant has a very strong scent of peppermint[245]. Hybridizes freely with other members of this genus. Polymorphic[200]. The flowers are very attractive to bees and butterflies[24]. A good companion plant for

resulting in frost damage overwinter[200]. A very ornamental tree[1]. Closely related to Q. acutissima[1]. Trees respond well to coppicing[109]. The seed ripens in its second year[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.348 Quercus shumardii

Shumard Oak, Schneck oak

4 tin 8 cyuc 2 ckak 0 tcan 2 dwat 30 m hkuc  
hmimhtut cyutli tcup hwicli jltunyk hpa7tli flatprikhlwis hpa7tmwatli hjonli

drutta Quercus shumardii is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. Up to 25mm long and wide[227], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - heavy, hard, strong, close grained[82, 149, 227]. It weighs 57lb per cubic foot[227]. A very valuable timber; it is used for lumber, flooring, furniture, veneers, cabinet making etc[82, 149, 229].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A moderately fast-growing tree in the wild, it commences bearing seeds when about 25 years old[229]. Seed production is cyclic, a year of high yields being followed by 1 - 3 years of low yields[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Plants in the wild are very susceptible to the disease 'oak wilt'[274]. Closely related to Q. rubra and Q. coccinea[11]. Intolerant

of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.349 Picea glehnii

Sakhalin Spruce

4 tin 7 cyuc 2 ckak 0 tcan 0 dwat 30 m hkuc  
htut cyutli tucphja7n hwicli hysihrasjltunykfrip hpa7tli frusflatprikslip hpa7tmwatli hjonli

drutta Picea glehnii is an evergreen Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

ckakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw. Too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta WoodWood - beautifully grained. Used for pianos, violins, interiors of buildings etc[46, 61]. It is also valued for its use in the pulp industry to make paper[171].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Another report says that it grows well on very alkaline soils so it might be suitable for cultivation on alkaline soils. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Fairly fast growing in Britain, able to average 30cm a year for at least the first 50 years[185]. Another report says that it is not a good grower in Britain[1]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Special Features: Inconspicuous flowers or blooms.

Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Leaves Sap Seedpod**Edible Uses:** SweetenerThe sap contains sugar and can be used as a drink or be concentrated into a syrup by boiling off the water[183]. The syrup is used as a sweetener on many foods. It can be harvested in late winter but is not produced in economic quantities[2, 4, 13, 105]. About 25 grams of sugar is obtained from a litre of the sap[4]. The sap can also be used to make a wine[183]. The flow is best on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. The keys of the developing seeds have a sweet exudation on them and this is often sucked by children[183]. The leaves can be wrapped round food such as buns when baking them and they impart a sweet flavour[66]. The related Oregon Maple (*Acer macrophyllum*) has yellow flower clusters, sweet with nectar, eaten raw[183]. No information was found for this species.

**tcanta Charcoal Fuel Pioneer Preservative Shelterbelt Wood**The trees are fast-growing and make a good windbreak for exposed and maritime areas[11, 200]. They are often used in shelterbelt plantings[200]. This species usually self-sows freely and is often the first tree to invade disused farmland, cleared woodland etc. Its ability to tolerate difficult environments make it a good pioneer species for re-establishing woodlands. When grown in Britain it is usually gradually displaced over a period of 200 years or more by native species until it becomes just a minor component of the woodland[K]. The leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - very hard, heavy, elastic, easy to work, fairly resistant to insects. Used for carving, small domestic items, veneer etc[4, 13, 46, 171]. It is a good fuel and also makes a good charcoal that can be used as a fuel[115]. **dwatta Astringent Vulnerary**The bark has mild astringent properties and has been used to make a wash for skin problems and an eyewash for sore eyes[21]. The inner bark of the tree, containing the sweet sap, can be used as a dressing for wounds[21].

**propta Seed** - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. Seed should not be dried below 35% moisture[98]. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Cultivars can be budded onto rootstocks of the species. Any grafting is best carried out in September rather than February.

**nwatta Landscape Uses:** Firewood, Seashore, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil and a sunny position[11, 17], but tolerates most conditions including poor soils and some shade[13, 17, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Dislikes wet soils[115]. Grows better in the cooler areas of the country[11]. Very wind-resistant, tolerating maritime exposure though it is often wind and salt pruned in very exposed areas[4, 11, 17]. A fairly aggressive tree, it self-sows freely and inhibits the growth of nearby plants[18, 20]. It is often one of the first trees to colonize open land. It is fast growing and establishes rapidly. It can supplant native trees, at least in the short-term, though recent evidence suggests that in the long term it does not usually become the dominant tree in British woodlands and it is often recommended for planting in broad-leaved woods by the Forestry Commission, especially in windy areas[K]. Plants are subject to sooty bark disease - this is not fatal and occurs most of

ten in years that follow hot summers[11]. There are many named forms that have been selected for their ornamental value[200]. Trees take 25 years to come into bearing from seed[98]. **Special Features:**Not North American native, Naturalizing, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.347 *Quercus variabilis*

**Chinese Cork Oak**

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 30 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

**drutta Quercus variabilis** is a deciduous Tree growing to 30 m (98ft 5in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to April, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Seed**Edible Uses:** CoffeeSeed - cooked[105, 177]. Very nutritious, but it needs to be leached[179]. The seed is up to 2cm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

**tcanta Cork Dye Repellent Roofing Tannin Wood**A mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The bark is a source of cork[11, 123]. A 10 metre tall tree at Kew has less than 4cm thickness of cork on it[K]. A black dye is obtained from the seed cupules[61, 109]. The bark is used for roofing[109]. Wood. Used for boat making and construction[109].

**dwatta Astringent Dysentery**Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

**propta Seed** - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

**nwatta Experimental Crop Industrial Crop:** Cork Industrial Crop: Tannin Management: Standard-Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood

growing near brassicas and tomatoes, helping to deter insect pests[20]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.338 *Potentilla anserina*

**Silverweed**

4 tlin 8 cyuc 3 kcaak 2 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfjxre7t hjonli

**drutta Potentilla anserina** is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Leaves Root**Edible Uses:** TeaRoot - raw or cooked[66, 74, 183]. It can also be dried and ground into a powder then used in soups etc or mixed with cereals[5, 12, 13, 54]. A nice taste, crisp and nutty with a somewhat starchy flavour[85, 183]. The roots are rather thin, though perhaps their size could be improved in cultivation[K]. **Edible young shoots** - raw[74]. A tea is made from the leaves.

**tcanta Cleanser Tannin**A sprig placed in the shoe can help prevent blisters[66]. An infusion of the leaves makes an excellent skin cleansing lotion[66], it is also used cosmetically as a soothing lotion for reddened skin and for the delicate skins of babies[7]. All parts of the plant contain tannin, though the report does not give quantities[4]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

**dwatta Analgesic Antidiarrhoeal Antispasmodic Astringent Diuretic Foot care Haemostatic Odontalgic Tonic**Contemporary medical herbalists believe that silverweed's main medicinal value lies in its astringency. It is less astringent than the related *P. erecta*, but it has a gentler action within the gastro-intestinal tract[254]. The whole plant is antispasmodic, mildly astringent, diuretic, foot care, haemostatic, odontalgic and tonic[4, 7, 9, 21]. A strong infusion is used to check the bleeding of piles and to treat diarrhoea, it is also used as a gargle for sore throats[4]. Externally, it is used as a powder to treat ulcers and haemorrhoids whilst the whole bruised plant, placed over a painful area, will act as a local analgesic[7, 254]. The roots are the most astringent part of the plant[4], they are harvested in late summer or autumn and dried for later use[254]. The leaves are harvested in early summer and dried for later use[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Potentilla anserina* Silverweed for diarrhoea, inflammation of the mouth and pharynx, premenstrual syndrome (see [302] for critics of commission E).

**propta Seed** - sow early spring or autumn in a cold frame. Prick out the seedlings into individual pots once they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Division is also very easy at almost any time the plant is in growth. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** A very easily grown plant, succeeding in almost any soil, thriving in moist clays, though rather dwarfed in dry dusty soils[4]. It grows best in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Silverweed was formerly cultivated for its edible root[5, 67]. It is still possibly cultivated in parts of Scotland (1992)[183]. This plant spreads vigorously by its running roots and can be very invasive[1, 4]. It grows well in a meadow, or places where the grass is only cut occasionally[K]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if

available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.339 *Viola adunca*

**Western Dog Violet, Hookedspur violet, Kirk's violet**

4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyfjxre7t hjonli

**drutta Viola adunca** is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Leaves**Edible Uses:** TeaYoung leaves and flower buds - raw or cooked[177, 183]. When added to soup they thicken it in much the same way as okra[62, 85, 159]. A tea can be made from the dried leaves[183].

**tcanta Dye**A blue dye can be obtained from the flowers[257].

**dwatta Analgesic Antiasthmatic Birthing aid Ophthalmic Poultice Salve**An infusion of the leaves and roots has been used to treat stomach problems and asthma in children[257]. An infusion of the roots and leaves has been used as a wash and poultice on sore and swollen joints[257]. The roots and leaves have been chewed by women during childbirth[257]. A poultice of the chewed leaves has been applied to sore eyes[257]. A poultice of the crushed flowers has been applied to the side or chest in the treatment of pain[257].

**propta Seed** - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

**nwatta** Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. There is at least one named form selected for its ornamental value[200]. 'Alba' has white flowers[200]. Flowers formed late in the season are cleistogamous (lacking petals, the flowers do not open but are self-pollinated)[212].

## 5.2.340 *Polygonum bistortoides*

**American Bistort**

4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

**drutta Polygonum bistortoides** is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves Root Seed**Edible Uses:** Leaves - raw or cooked. A pleasant acid flavour, they are used as a potherb[183]. Root - raw or cooked[106]. Starchy and rather pleasant[85], the root can be baked or added to

soups, stews etc[105, 161, 183, 257]. It was often dried before being used[207]. The raw root is slightly astringent, it becomes sweeter when boiled but is best when baked[212]. Seed - raw or cooked. It is rather small and fiddly to utilize.

tcanta None known

dwatta Astringent PoulitceThe root is astringent. A poultice has been used in treating sores and boils[257].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment[1]. Plants are growing well at Kew in a moist position by water in the rock garden[K]. Plants seem to be immune to the predations of rabbits[233]. This species is closely related to *P. viviparum*[1] and *P. bistorta*[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.341 Cardamine amara

Large Bittercress

4 tlin 8 cyuc 3 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine amara is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to June, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw[2, 61, 115]. A hot cress-like flavour[183], nice in small quantities in a salad and available all year round in most years[K]. A somewhat bitter flavour[9].

tcanta None known

dwatta Antiscorbutic Diuretic StimulantAntiscorbutic, diuretic, stimulant[132].

propta Seed - sow outdoors in situ in a shady position in April.

nwatta Easily grown in most moist soils[187]. Prefers a moist humus rich soil in shade or semi-shade[200]. Plants are hardy to at least -20°C[187]. An invasive plant spreading freely by self-sowing, it is best suited to the wild garden[187]. A polymorphic species[132].

## 5.2.342 Stellaria graminea

Lesser stitchwort

4 tlin 8 cyuc 3 kcaak 2 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Stellaria graminea is a deciduous Perennial growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta Leaves and shoots used in salads or lightly cooked as a vegetable. Harvest young shoot in spring to summer [1-9].

tcanta Faunal Associations: The nectar and pollen of the flowers attract small bees and flies primarily. The caterpillars of several moth species feed on the foliage of Chickweeds, including *Agrostis venerabilis* (Venerable Dart), *Lobocleta ossularia* (Drab Brown Wave), and *Haematopis grataria* (Chickweed Geometer). Mourning Doves and various sparrows occasionally eat the seeds of Chickweeds, while rabbits and groundhogs eat the foliage [1-6]. Attractive flowers. A good bee plant.

dwatta The common name Stitchwort is a reference to a herbal remedy in which the various stitchwort plant were used - allegedly to cure that pain in the side known as 'stitch', which afflicts many people when they try to run after a long layoff from sporting activities.

propta Seed - broadcast in spring [1-9].

nwatta A rhizomatous perennial herb producing branching stems which are prostrate, sprawling, trailing, or erect. An attractive chickweed. Typical growing conditions are full sun and moist to mesic soil. Grows quite well in loam or clay-loam. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.343 Picea purpurea

Purple-Coned Spruce

4 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 45 m hkuc

htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Picea purpurea is an evergreen Tree growing to 45 m (147ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw. Too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta WoodWood - soft, not strong, resinous. Used for general construction[46, 61]. It is also valued for its use in the pulp industry to make paper[171]. This species produces a fine quality timber similar to that from *P. likiangensis*[266].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions

in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Landscape Uses:Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Tolerates various sites[81]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. Although dormant trees are cold-hardy, the young shoots in spring are often damaged by late frosts[1]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Fairly fast growing after a slow start, trees can average height increases of 30 - 40cm a year[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 5.2.344 Fagus crenata

Japanese Beech

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 35 m hkuc

pcimhmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Fagus crenata is a deciduous Tree growing to 35 m (114ft 10in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Coffee OilYoung leaves - raw[105]. A very nice mild flavour but the leaves quickly become tough so only the youngest should be used. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Edible seed - raw or cooked[105, 177]. Rich in oil. The seed should not be eaten in large quantities, see the notes above on toxicity. It can be dried and ground into a powder. An edible semi-drying oil is obtained from the seed[105, 177]. The roasted seed is a coffee substitute.

tcanta OilNone known

dwatta None known

propta Seed - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

nwatta Thrives on a light or medium soil[11], doing well on chalk[1], but it is ill-adapted for heavy wet soils[1]. Young trees are very shade tolerant, but are subject to frost damage so are best grown in a woodland position which will protect them[200]. Although very cold hardy, this species requires hotter summers than are normally experienced in Britain so is not usually a success here and is very slow growing[200]. Trees have surface-feeding roots and also cast a dense shade.

This greatly inhibits the growth of other plants and, especially where a number of the trees are growing together, the ground beneath them is often almost devoid of vegetation.

## 5.2.345 Ulmus japonica

Japanese Elm

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 35 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Ulmus japonica is a deciduous Tree growing to 35 m (114ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to May, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Inner bark LeavesEdible Uses: Leaves - raw or cooked[105, 177]. Young fruits - cooked[105, 177]. The fruit is about 15mm long and 10mm wide[200]. Inner bark - cooked. It is usually dried, ground into a powder and then used as a thickening in soups or added to cereal flours when making bread etc[105, 177].

tcanta Fibre WoodA fibre is obtained from the inner bark[189]. The bark is soaked for 7 - 10 days in water, the inner and outer barks are then separated and the inner bark is stripped into strands and made into thread by chewing it. It is made into a coarse fabric[189]. Wood - heavy, difficult to work. Used for axles, hubs etc[46, 61].

dwatta Diuretic Nerveine PurgativeThe bark is diuretic, nerveine and purgative[218].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. This species is resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. Closely related to *U. davidiana*[200], and considered to be no more than a subspecies of that species by some botanists[266].

## 5.2.346 Acer pseudoplatanus

Sycamore, Great Maple, Scottish Maple, Planetree Maple

4 tlin 7 cyuc 2 kcaak 4 tcan 1 dwat 30 m hkuc

hmimhtut cyutli tcup hwicli hyishrasjlutnyikrip hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Acer pseudoplatanus is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils.

them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Basal cuttings in spring. Harvest the shoots when they are about 5cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Tolerates most well-drained soils, preferring a dry sandy soil and a sunny position[4, 37, 200]. Tolerates partial shade[16]. Established plants are drought tolerant[200]. Can be grown in grass[54]. Tolerates a pH in the range of 6.8 to 8. Plants are hardy to at least -15°c[200]. They often deteriorate in very wet or cold winters, but usually recover quickly in the spring and early summer[238]. Chamomile is commonly grown in the domestic herb garden, it is also cultivated commercially for its flowers which are used in herb teas and medicinally. The double-flowered form is highly regarded for its medicinal virtues[165]. Plants can be invasive when growing in good conditions[188], though they are easy to control[K]. There is some confusion between this plant (which is a perennial) and the annual chamomile (*Matricaria chamomilla*) as to which is the genuine medicinal chamomile. Some reports say that this plant is the most effective herbally[4], whilst others say that *Matricaria* is more potent[9]. Both plants seem to have very similar properties and either can probably be used quite successfully. Chamomile is a very good companion plant, promoting the health of plants it is growing close to, it is especially good for growing near cabbages, onions and, in small quantities, wheat[4, 14, 20, 54, 201, 238]. The cultivar 'Treneague' is a low-growing non-flowering form that makes an excellent ground cover[197]. Fairly tolerant of being walked on, it is sometimes used instead of grass for making a lawn though it is more difficult to maintain and can become weed-infested, especially in its early stages[200]. It also tends to become bare in places[208]. The whole plant has a pungent aroma, this being especially noticeable on hot days or when the plant is bruised. Suitable for temperate areas; in subtropical areas, it requires partial shade and will be short-lived; it is unlikely to grow in tropical areas. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

### 5.2.568 Liriope spicata

Lily Turf, Creeping liriope, Creeping Lilyturf
4 tin 10 cyuc 2 kcaok 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli hgtakyuuctup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Liriope spicata is an evergreen Perennial growing to 0.3 m (1ft) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: RootEdible Uses: The following use is reported for *L. graminifolia*, but there is a lot of confusion between members of this genus (compare [58] and [200]) and it is quite possible that the root of this species is also used[K]. Root - cooked[105, 177, 179]. Candied and used

medicinally[61]. The roots are usually with fusiform with a fleshy, tuberous part near the tip[266]. Rich in mucilage, the root also contains about 1.6% protein, 0.5% fat, 80% carbohydrate and 2.3% ash[179].

tcanta A good drought tolerant evergreen ground cover plant[200]. Plants should be spaced about 45cm apart each way, they can be invasive though[208]. Plants have been grown indoors in pots in order to help remove toxins from the atmosphere. It is especially good at removing ammonia[259].

dwatta Aphrodisiac Pectoral StimulantThe root is aphrodisiac, pectoral and stimulant[61].

propta Seed - we have no information on this species but suggest sowing it in a cold frame or greenhouse as soon as the seed is ripe if possible, if not then sowing the stored seed in early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, the larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Erosion control, Ground cover, Massing, Rock garden, Seashore, Woodland garden. Prefers a sandy soil[1]. Succeeds in full sun so long as the soil does not dry out in the summer, otherwise it should be grown in partial shade in any moderately fertile well-drained soil[200]. There are some named forms selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Inconspicuous flowers or blooms.

### 5.2.569 Daucus pusillus

Rattlesnake Weed, American wild carrot
4 tin 8 cyuc 2 kcaok 0 tcan 2 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Daucus pusillus is a BIENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[46, 61, 105, 161, 257].

tcanta None known
dwatta Antipruritic Blood purifier Febrifuge PoulticeThe plant is antipruritic, blood purifier and febrifuge[257]. A decoction has been used to treat colds, itches, fevers and snakebites[257]. A poultice of the chewed plant has been applied to snakebites[257].

propta Seed - sow August/September or April in situ. The seed germinates better if it is cold stratified, therefore the autumn sowing is liable to be more successful.

nwatta We have very little information on this plant, but it can be grown outdoors at least in southern Britain and probably in the north as well. It is likely to need a well-drained soil in a sunny position[K].

### 5.2.570 Lewisia rediviva

Bitter-Root

4 tin 8 cyuc 2 kcaok 0 tcan 2 dwat 0.1 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lewisia rediviva is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from September to July, in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers

drutta *Pyrus elaeagnifolia kotschyana* is a deciduous Tree. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. The flesh is rather tough and gritty, but has a reasonable flavour when it is fully ripe[K]. The fruit is up to 2cm long[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°c[200]. This sub-species differs from *P. eleagrifolia* in having thornless branches[200]. Closely related to *P. georgica*[93].

#### 5.2.415 Vaccinium amoenum

Large-Cluster Blueberry

4 tin 8 cyuc 2 kcaok 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium amoenum is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. The fruit is about 8mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. This species is closely related to *V. virgatum*[1]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.416 Lilium medeoloides

4 tin 8 cyuc 2 kcaok 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium medeoloides is a BULB growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[74, 105]. The bulb is about 25mm in diameter[266]. Used in soups or as a porridge[143]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known

dwatta None known

propta Seed - delayed hypogaeal germination according to one report[163], whilst two others suggest that it might be immediate hypogaeal germination[130, 200]. If it is delayed then it is best sown as soon as it is ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. If it is immediate then a late winter to early spring sowing should germinate in 2 - 4 weeks[163] Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Stem rooting, the bulbs should be planted 7 - 12cm deep in practically pure leaf mould with plenty of grit added[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Closely related to *L. distichum* and *L. tsingtaunense*[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

### 5.2.417 Polygonatum multiflorum

Solomon's Seal, Eurasian Solomon's seal

4 tin 8 cyuc 2 kcaok 0 tcan 3 dwat m hkuc pcmihmim cyutli hgtakyuuctup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Polygonatum multiflorum is a PERENNIAL growing to 1.2 m (4ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked. Boiled and used as an asparagus substitute, they make an excellent vegetable[2, 4, 115] and are widely used in Turkey[244]. Root - cooked[177, 179]. Rich in starch[115]. The root should be macerated for some time in water in order to remove bitter substances[4]. Normally only used in times of famine, the root was powdered and then made into a bread by the North American Indians[244].

tcanta CosmeticPlants can be grown for ground cover when spaced about 30cm apart each way[208]. A distilled water made from the whole plant is used as a cosmetic to improve the complexion[244].

dwatta Astringent Demulcent Dysentery Emetic Poulrice TonicSolomon's seal has been used for thousands of years in herbal medicine. It is used mainly in the form of a poultice and is believed to prevent excessive bruising and to stimulate tissue repair[254]. The root is astringent, demulcent, emetic and tonic[4, 21, 61, 240]. An infusion is healing and restorative, it is good in the treatment of stomach inflammations, chronic dysentery etc[4]. It is used with other herbs in the treatment of pulmonary problems, including tuberculosis, and women's complaints[4, 254]. The powdered roots make an excellent poultice for bruises, piles, inflammation etc[4]. The root is harvested in the autumn and dried for later use[4]. The plant should not be used internally except under professional supervision[254]. A distilled water made from the whole plant has been used as a skin tonic and is an ingredient of expensive cosmetics[244]. The dried powdered roots and flowers have been used as a snuff to promote sneezing and thus clear the bronchial passages[244].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Succeeds in dry shade if the soil is rich in humus[190]. Grows well in heavy clay soils. Plants are intolerant of heat and drought but tolerate most other conditions[200]. Another report suggests that they tolerate drought so long as the soil is rich in humus[190]. A very ornamental plant[1], growing well on the woodland edge[24]. There are some named forms[188]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs[K]. Hybridizes with other members of this genus[200].

## 5.2.418 Malus sargentii

Sargent's apple, Sargent Crabapple  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 4 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnykfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Malus sargentii is a deciduous Shrub growing to 4 m (13ft) by 5 m (16ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. Large for a crab apple[183], it is up to 1cm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in

a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta Landscape Uses:Border, Pest tolerant, Specimen. An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[200]. Of doubtful botanical standing, it is considered to be synonymous with *M. sieboldii* by some Japanese botanists[182]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. This species is considered to be no more than a part of *M. sieboldii* by many botanists[58]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 5.2.419 Aesculus parviflora

Bottlebrush buckeye

4 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 4 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Aesculus parviflora is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[2, 22, 105, 177]. It can be dried and ground into a powder and used as a gruel. The seed is quite large and easily harvested, though it is rarely produced in Britain[11]. Unfortunately, it is rich in bitter-tasting saponins and these need to be leached out before the seed can be eaten. See notes on toxicity above. The following notes apply to *A. californica*, but are probably also relevant here: The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213]. Most of the minerals etc would also have been leached out by this treatment[K].

tcanta Miscellany Soap WoodSaponins contained in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Plants can be used as a tall ground cover for large areas of land[208]. They are slow to establish but eventually form large spreading clumps[208]. Wood - easily worked. Used for making water troughs, packing cases, tea boxes, ornamental articles etc[194].

dwatta Antiperiodic Antirheumatic MiscellanyAntiperiodic, antirheumatic[194]. Used in the treatment of colic, piles, constipation and whooping cough[194].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer. Root cuttings 5 - 7 cm long in December. Store the roots upside down in sand and pot them up in March/April[78]. Grow them on until they are 20cm or more tall and then plant them out into their permanent positions, preferably in late spring or early summer after the last expected frosts. Division of suckers in the dormant season[200]. The suckers can be planted out direct into their permanent positions if required.

nwatta Landscape Uses:Border, Massing, Specimen, Woodland garden. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. Succeeds in most situations in sun

Unlike the related opium poppy (*P. somniferum*) it is non-addictive[244]. However, the plant does contain alkaloids, which are still under investigation, and so should only be used under the supervision of a qualified herbalist[244]. The flowers and petals are anodyne, emollient, emmenagogue, expectorant, hypnotic, slightly narcotic and sedative[4, 7, 9, 13, 46, 53]. An infusion is taken internally in the treatment of bronchial complaints and coughs, insomnia, poor digestion, nervous digestive disorders and minor painful conditions[9, 238]. The flowers are also used in the treatment of jaundice[218]. The petals are harvested as the flowers open and are dried for later use[238]. They should be collected on a dry day and can be dried or made into a syrup[4]. The latex in the seedpods is narcotic and slightly sedative[240]. It can be used in very small quantities, and under expert supervision, as a sleep-inducing drug[7]. The leaves and seeds are tonic[240]. They are useful in the treatment of low fevers[240]. The plant has anticancer properties[218].

propta Seed - sow spring or autumn in situ[200].  
nwatta Landscape Uses:Border, Massing, Seashore, Specimen. Prefers a well-drained sandy loam in a sunny position[1, 200]. Does not do well on wet clay soils but succeeds in most other soils[115]. Plants usually self-sow freely when growing in suitable conditions so long as the soil surface is disturbed[238]. There are several named varieties selected for their ornamental value[200]. A polymorphic species, varying in leaf shape and flower colour[17]. When growing in cereal fields, poppies decrease the yields of nearby cereal plants[18, 20]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers, Suitable for dried flowers.

## 5.2.566 Uvularia perfoliata

Bellwort, Perfoliate bellwort

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.4 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Uvularia perfoliata is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[55, 105, 161]. They are a very good substitute for asparagus[2]. Root - cooked[2, 105, 161].

tcanta MiscellanyNone known  
dwatta Miscellany Ophthalmic SalveThe root is used as a poultice or salve in the treatment of boils, wounds and ulcers[207]. A tea made from the roots is used in the treatment of coughs, sore mouths and throats, inflamed gums and snakebites[222, 257]. It is suitable for use by children[257]. An infusion of the crushed roots has been used as a wash to treat sore eyes[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division after the plants die down in late summer. It is best carried out in early spring before the plants flower[188]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Requires a cool moist shady position and a light sandy soil[1, 42, 111]. Likes plenty of humus in the soil[111]. Grows well in a woodland garden and in the rock garden[200]. Plants grow much taller in rich soils and then succeed in the herbaceous border[222]. A very hardy plant, tolerating temperatures down to about -20°C[187].

## 5.2.567 Chamaemelum nobile

Chamomile, Roman chamomile

4 tin 9 cyuc 2 kcaak 4 tcan 5 dwat 0.2 m hkuc  
hmimhtut cyutli hgtkyuctcup hwicli hyhisrhrajlutnyk hpa7tli flatprikliw hpa7tmwatli fyfikre7t hjonli

drutta Chamaemelum nobile is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from June to July, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers ShootsEdible Uses: Condiment TeaYung sprigs are used as a seasoning and a flavouring in herb beers[15, 183]. The fresh or dried flowers are used to make herb teas[21, 37, 183]. This has a strong aromatic odour and a bitter flavour, especially the single-flowered form[4]. The whole herb is used for making herbal beers[4].

tcanta Companion Compost Dye Essential Fungicide Hair Liquid feed Repellent StrewingAn infusion of the flowers is used as a hair shampoo, especially for fair hair[14, 20, 168]. It is also used as a liquid feed and general plant tonic[14], effective against a number of plant diseases[18, 20, 201]. It has fungicidal properties and its use is said to prevent damping off in seedlings[238]. The flowers are an ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The whole plant was formerly used as a strewing herb[4, 168]. The whole plant is insect repellent both when growing and when dried[14, 20]. An essential oil from the whole plant is used as a flavouring and in perfumery[46]. Yellow to gold dyes are obtained from the flowers[168]. The plant makes a very good ground cover[197] and can also be used as an edging plant[200]. It does tend to become bare in patches[208]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anodyne Antianxiety Antiinflammatory Antispasmodic Aromatherapy Nervine Stomachic Tonic Vasodilator-Camomile is a common herb with a long history of safe and effective medicinal use - it is widely used as a household herbal remedy. It is particularly useful as a remedy for various problems of the digestive system, as a sedative and a nerveine, it is especially suited for young children[4, 20, 21]. A tea is made from the flowers and this should be prepared in a closed vessel to prevent loss of the essential oils[4]. The flowers are anodyne, anti-inflammatory, antispasmodic, nerveine, stomachic, tonic, vasodilator[4, 14, 21, 37, 165, 201]. The single-flowered form is the most potent medicinally, though it can in large doses damage the lining of the stomach and bowels[4]. For this reason, the double-flowered form is usually preferred since this contains less of the alkaloid that causes the problem[4]. The flowers are gathered in the summer when they are fully open and are distilled for their oil or dried for later use[238]. They should not be stored for longer than 12 months[238]. The whole herb is used to make a lotion for external application in the treatment of toothache, earache, neuralgia etc[4]. The essential oil is used in aromatherapy. Its keyword is 'Soothing'[210]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Chamaemelum nobile for coughs and bronchitis, fevers and colds, inflammations of the skin, inflammation of the mouth and pharynx, tendency to infection - improve immunity, wounds and burns (see [302] for critics of commission E).

propta Seed - sow March in a cold frame. Only just cover the seed and do not let the compost dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow



prikwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine leucantha is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: TeaLeaves - raw or cooked[105, 177]. The seedlings are edible[266]. Dried plants are used as a tea substitute[266].

tcanta None known

dwatta The rhizomes are used medicinally[266]. No further information is given.

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

## 5.2.563 Trillium sessile

Toadshade

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc

pchimhmhtut cyutli tcup hwicli hrasljutnyik hpa7tli flat-prikwis hpa7tmwatli xre7t hjonli

drutta Trillium sessile is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked. The young unfolding leaves are an excellent addition to the salad bowl, tasting somewhat like sunflower seeds[183]. The leaves can also be cooked as a potherb[183].

tcanta MiscellanyNone known

dwatta Miscellany SkinA poultice of the bruised leaves and crushed roots has been applied as a treatment for boils[257]. A decoction of the plant has been used to treat any kind of sickness[257].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°C. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist

in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. The flowers have a scent similar to a butcher's shop[207]. Another report says that they are sweetly scented[245]. Some named varieties have been selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

## 5.2.564 Tragopogon crocifolius

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.8 m hkuc

htut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Tragopogon crocifolius is a ANNUAL/BIENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[2, 177]. Leaves - raw or cooked[105].

tcanta None known

dwatta None known

propta Seed - sow spring in situ. Make sure to water the seed in if the weather is dry.

nwatta Succeeds in ordinary garden soils, including heavy clays[200].

## 5.2.565 Papaver rhoeas

Corn Poppy, Field Poppy, Shirley Poppy

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.6 m hkuc

htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Papaver rhoeas is a ANNUAL growing to 0.6 m (2ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil SeedEdible Uses: Colouring OilSeed - raw or cooked. Much used as a flavouring in cakes, bread, fruit salads etc[4, 5, 21, 183], it imparts a very nice nutty flavour[K]. The seeds are rather small, but they are contained in fairly large seed pods and so are easy to harvest. The seeds are perfectly safe to eat, containing none of the alkaloids associated with other parts of the plant[238]. Leaves - raw or cooked[7, 52]. Used like spinach or as a flavouring in soups and salads[132, 183]. The leaves should not be used after the flower buds have formed[7]. Some caution is advised, see the notes above on toxicity. An edible oil is obtained from the seed[2, 4]. Said to be an excellent substitute for olive oil[4, 183], it can be used in salad dressings or for cooking[2]. A syrup can be prepared from the scarlet flower petals, it is used in soups, gruels etc[4, 183]. A red dye from the petals is used as a food flavouring, especially in wine[183].

tcanta Dye Ink Oil Pot-pourriA red dye is obtained from the flowers[7, 46, 61], though it is very fugitive[4]. A syrup made from the petals has been used as a colouring matter for old inks[4, 13, 89]. The red petals are used to add colour to pot-pourri[238].

dwatta Anodyne Cancer Emmenagogue Emollient Expectorant Hypnotic Sedative TonicThe flowers of corn poppy have a long history of medicinal usage, especially for ailments in the elderly and children[244, 254]. Chiefly employed as a mild pain reliever and as a treatment for irritable coughs, it also helps to reduce nervous over-activity[254].

or shade[126, 200]. Plants are very shade tolerant[200]. A very ornamental plant[1, 11], it is hardy to about -20°C[184] though it is slow to establish[208]. The young growth in spring can be damaged by late frosts. The flowers have a delicate honey perfume[245]. This species does best on the western side of Britain according to one report[126] whilst another says that it is best in a continental climate, which would suggest that it was best grown in the eastern half of the country[200]. Trees rarely fruit in Britain except after a long hot, dry summer[11, 130]. Spreads freely by suckers[182]. Grows well on a lawn[11]. Most members of this genus transplant easily, even when fairly large[11]. Special Features:Attractive foliage, North American native, All or parts of this plant are poisonous, Wetlands plant, Blooms are very showy.

## 5.2.420 Eleutherococcus sessiliflorus

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 4.5 m hkuc

hmimhtut cyutli tcup hwicli vyhshrasljutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Eleutherococcus sessiliflorus is a deciduous Shrub growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Drink TeaYoung leaves - raw or cooked and used as a vegetable[105, 177, 183]. Old leaves are dried and used as a tea substitute[105, 177, 183]. A wine is made from the bark. It is highly fancied by the Chinese[183]. It is probably used mainly for medicinal purposes[K].

tcanta None known

dwatta Adaptogen Analgesic Antiinflammatory Antipyretic DiureticThe root bark contains saponins, acanthosides, cardiac glycosides and polysaccharides[279]. It is adaptogenic, analgesic, anti-inflammatory, antipyretic and diuretic[176, 218, 279]. It is used in Korea in the treatment of lumbago, neuralgia, arthritis and oedema[279].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season's growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Succeeds in an open loamy soil[1], preferring a well-drained humus-rich soil in full sun[200]. Tolerates poor soils and atmospheric pollution[200]. A very cold resistant plant[74] if it is sheltered from cold winds, tolerating temperatures down to at least -15°C[200]. A very ornamental plant[74], it spreads vigorously by means of suckers[200]. This species is closely related to *E. divaricatus*[200].

## 5.2.421 Pinus monticola

Western White Pine

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc

htut cyutli hgatkyuctcup hwicli vyhshrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus monticola is an evergreen Tree growing to 60 m (196ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist

soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark SeedEdible Uses: Condiment GumSeed - raw or cooked[105, 177]. The oil-rich seed has a resinous flavour. Rather small, the seed is only 5mm long[200]. The seed is up to 9mm long[82, 229]. An edible gummy exudation from the stem is used as a chewing gum[257]. Inner bark - raw or cooked[177, 257]. The inner bark can be dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[257]. The roasted young cones can be eaten[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Gum Herbicide WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - straight and close-grained, soft, light, not strong, very durable, resistant to shrinking and warping. An important timber tree, it is used in making doors, shelves, flooring, construction etc[46, 61, 82, 171, 229]. The wood has dark knots, making it attractive for panelling[226].

dwatta Antirheumatic Antiseptic Diuretic Pectoral Poul-tice Salve TBThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4, 257]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4, 257]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. An infusion of the bark has been used as a blood purifier and in the treatment of stomach disorders and tuberculosis[257]. A decoction of the bark has been used as a wash on cuts and sores[257]. A decoction of the young shoots has been used as a soak in the treatment of rheumatism[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Screen, Specimen. Thrives in a light well-drained sandy or gravelly loam in a sunny position[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. A fast growing tree, capable of sustaining growth of 75cm per year over a long period of time even when in an unfavourable site. This species establishes very well on severely altered sites such as after a forest fire[229]. Trees on a site 300m above sea level in N.

Wales have grown exceptionally well[185]. Girth increases of up to 4cm a year have been recorded[185]. Trees take 30 - 40 years before they produce reliable crops of seeds[229]. Good crops are produced every 2 - 4 years in the wild, with little seed in the intervening years[229]. The cones are 12 - 27cm long and take 2 years to mature[82, 229], they open and shed their seed in late summer and early autumn whilst still attached to the tree[82, 226]. Very susceptible to 'white pine blister rust' this tree should not be planted near *Ribes* species (currants and gooseberries) because they can transmit the rust(1, 11, 120). Most of the older trees in this country have been killed by the rust. However, it seems that infection only occurs when the trees are young in this country and new plantings in areas isolated from species of *Ribes* are being made[185]. Plants are also subject to damage by aphids. Trees have a thin bark, which makes them susceptible to forest fires[226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow beneath the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Attracts birds, Attractive foliage, North American native, Inconspicuous flowers or blooms.

## 5.2.422 *Lilium martagon*

Turk's Cap Lily, Martagon lily  
4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat m hkuc  
hmmihmt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxfre7t hjonli

drutta *Lilium martagon* is a BULB growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Bulb - cooked[2, 14, 61]. It is often dried for later use[46]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known  
dwatta Cardiac Diuretic Emmenagogue Emollient ExpectorantThe bulb is diuretic, emmenagogue, emollient and expectorant[240]. They are used to relieve heart diseases, pain in the cardiac region and angina pectoris[240].

propta Seed - delayed hypogeal germination[130]. Best sown as soon as it is ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Landscape Uses:Border, Container, Massing, Seashore, Specimen, Woodland garden. Succeeds in ordinary well-drained garden soil[1, 42]. Prefers a good leafy soil in sun or semi-shade[90]. Prefers its roots to be in the shade[28]. Prefers a calcareous soil according to some reports[1, 4, 13, 90], whilst one says that it is probably best in an acid or neutral soil[47]. A very ornamental[1] and polymorphic plant[143]. It takes 7 - 8 years to flower from seed[143]. The flowers have an unpleasant odour[143]. The flowers are sweetly fragrant, especially at night in order to

attract the night hawk-moth for pollination[245]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Special Features:Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

## 5.2.423 *Malus halliana*

Hall crab apple  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 4 m hkuc  
hmmihmt cyutli tcup hwicli hrasjlutnyikfriip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Malus halliana* is a deciduous Tree growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. 6 - 8 mm in diameter[200]. A healthy tree at Kew in September 1989 had small acid fruits[K].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1 °c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. The sub-species *M. halliana* spontanea. (Mak.)Koidz. has slightly larger fruits than the type, they are up to 1 cm in diameter[200]. Hybridizes freely with other members of this genus[200]. The fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.424 *Morus mongolica*

Mongolian Mulberry  
4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat m hkuc  
hmmihmt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfynyanhjen hjonli

drutta *Morus mongolica* is a deciduous Tree growing to 7.5 m (24ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[3, 105]. Sweet but insipid[1, 11]. Palatable[109, 177]. The fruit is up to 25mm in diameter[200].

tcanta Fibre MiscellanyThe fibers of the bark are raw material for textile and paper making[266].

dwatta MiscellanyThe bark is used medicinally[266]. No more details are given.

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe

the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

## 5.2.559 *Lewisia brachycalyx*

Shortsepal lewisia  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmt cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Lewisia brachycalyx* is a PERENNIAL growing to 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from September to July, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. Steeped and boiled[177]. Said to be extremely nutritious. It is easiest to use when the plant is in flower because the outer layer of the root (which is very bitter) slips off easily at this time of the year[85]. The root has a good taste though a decided bitter flavour develops afterwards[105, 161].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame in a very freely draining soil[129]. Sow stored seed as soon as possible in a cold frame. One months cold stratification should improve germination, though this is still likely to be very slow. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first two winters. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March/April. Very difficult.

nwatta Requires a very well-drained gritty humus-rich deep soil in a sunny position[1, 200]. Prefers a neutral to acid soil[188]. This species is not reliably hardy in Britain[1]. It can withstand consistently very cold weather but does not like alternating periods of mild and cold conditions, nor does it like winter wet[1]. The plant is very susceptible to rotting at the neck in a damp soil[200]. Plants die down after flowering and start growing again in the autumn[188]. Very apt to hybridize with other members of this genus[1].

## 5.2.560 *Hosta longissima*

Swamp Hosta  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmmihmt cyutli tcuphja7n hwicli hrasjlutnyikfriip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Hosta longissima* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked[105, 177].

tcanta None known  
dwatta None known  
propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough

to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[11]. A plant of boggy places, it is flood tolerant[187]. Does well in the semi-shade of a woodland[200] also succeeding in deeper shade[187]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soil washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. The rhizome creeps extensively[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A polymorphic species, it hybridizes freely with other members of this genus[200].

## 5.2.561 *Fritillaria atropurpurea*

Purple Fritillary, Spotted fritillary  
4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmmihmt cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Fritillaria atropurpurea* is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[212]. Rich in starch[212]. Rather small, it is usually less than 15mm in diameter[235].

tcanta None known  
dwatta SalveThe plant has been pulverized into a salve and applied to scrofulous swellings[257].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta A woodland plant, preferring light soils[1]. It is best grown in a well-drained sandy woodland soil[42, 90, 134]. Plants are best grown in a bulb frame and kept rather dry in summer[90]. Water should be withheld in summer or hot spells[164]. Closely related to *F. pinetorum*[270].

## 5.2.562 *Cardamine leucantha*

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmmihmt cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-

results have been achieved by using a distilled water from the plant as an eye lotion to treat conjunctivitis[7].

propta Seed - sow April in a cold frame. Germination is usually rapid, but the seedlings are prone to damp off so make sure they are well ventilated[1]. Prick them out into individual pots once they are large enough to handle and plant them out in the summer. Division in spring. Plant them straight out into their permanent positions.

nwatta Succeeds in ordinary garden soil[1], preferring damp conditions[24, 200], in sun or semi-shade[200]. Prefers a moist peaty soil[187]. Hardy to about -20°c[187]. Grows well in the summer meadow[24], it is an excellent bee and butterfly plant and a food plant for the caterpillars of many butterfly species[17, 24, 30].

### 5.2.556 Amaranthus spinosus

Spiny Amaranth

4 tlin 11 cyuc 2 kcaak 1 tcan 3 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Amaranthus spinosus is a ANNUAL growing to 0.6 m (2ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from April to October, in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Leaves and stems - raw or cooked as a spinach[2, 61, 177]. If older leaves and stems are used the spines must be removed[183]. Highly esteemed[183]. The dried leaves contain (per 100g) 267 - 276 calories, 20 - 34.4% protein, 2 - 4.5% fat, 45 - 54% carbohydrate, 9.8 - 10.4% fibre, 16.6 - 24% ash, 1795 - 5333mg calcium, 333 - 460mg phosphorus, 13.5 - 152.7mg iron, 13 - 37mg sodium, 337 - 3528mg potassium, 27.9 - 40.8mg betacarotene equivalent, 0.06mg thiamine, 2.02mg riboflavin, 7.7 - 8.6mg niacin and 503mg ascorbic acid[218]. Seed - cooked. Very small, about 1mm in diameter[266], but easy to harvest and very nutritious. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K], a valued food plant in Africa. In Thai cuisine, where it is called phak khom and in Tamil mullik keerai.

tcanta DyeYellow and green dyes can be obtained from the whole plant[168]. A red pigment obtained from the plant (the report does not specify which part of the plant) is used as a colouring in foods and medicines[238].

dwatta Antidote Astringent Diaphoretic Dysentery Eczema Emmenagogue Emollient Febrifuge Urinary VDThe seed is used as a poultice for broken bones[218]. The plant is astringent, diaphoretic, diuretic, emollient, febrifuge and galactagogue[4, 61, 147, 218, 238, 240, 272]. It is used internally in the treatment of internal bleeding, diarrhoea and excessive menstruation[238, 254]. It is also used in the treatment of snake bites[243]. Externally, it is used to treat ulcerated mouths, vaginal discharges, nosebleeds and wounds[238, 243]. The plant can be used fresh or it can also be harvested when coming into flower and dried for later use[238]. The root is emmenagogue and galactagogue[243]. A paste of the root is used in the treatment of menorrhagia, gonorrhoea, eczema and colic[243, 272]. It helps to remove pus from boils[272]. The juice of the root is used in Nepal to treat fevers, urinary troubles, diarrhoea and dysentery[272]. It is also used, often combinnd with the root juice of *Dichrophela integra* and *Rubus ellipticus*, to treat stomach disorders and, on its own, to treat indigestion and vomiting that occur after eating unusual foods[272].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196].

### 5.2.557 Polygonatum odoratum thunbergii

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc pcimhmm cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Polygonatum odoratum thunbergii is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Young shoots - raw or cooked[105]. They can be used as an asparagus substitute. Root - raw or cooked[2, 105]. Rich in starch.

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture-retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but they tolerate most other conditions[200]. Naturalizes well in woodlands and copses[1]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs[K]. Hybridizes with other members of this genus[200].

### 5.2.558 Cardamine prorepens

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.4 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine prorepens is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves and young plant - cooked[105].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°c[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after

if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. Closely allied to *M. alba*[1], and considered to be no more than part of that species by some botanists[200]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. Plants in this genus are notably resistant to honey fungus[200]. This species is dioecious[266]. Both male and female plants will need to be grown if fruit is required.

### 5.2.425 Quercus prinoides

Dwarf Chinkapin Oak

4 tlin 8 cyuc 2 kcaak 2 tcan 2 dwat 4 m hkuc hmimhtut cyutli yuqctcup hwicli hyisljutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus prinoides is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[105, 161, 177]. A sweet taste[227]. The seed is up to 15mm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed might contain bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent TanninThe leaves of most species in this genus are more or less rich in tannins. A mulch of the partially decayed leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc, and these will in time break down to add humus and nutrients to the soil. Fresh leaves should be used with caution, however, since as these decay they utilize some of the nitrogen in the soil and thus can inhibit plant growth[20 , K J]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff and is also used by many cultures to make ink[4 , 331 J]. The bark of oak trees is also usually rich in tannins and can be used as a dyestuff and for waterproofing rope[331 , K J]. As a source of wood and lumber the genus *Quercus* is one of the most important of all groups of trees. We have no specific information for this species, but in general he timber is noted for its strength, durability, and beauty, and is used everywhere for innumerable purposes, ranging from

fuel to railroad ties, construction of buildings and ships, interior trim, flooring, and all grades of furniture. The woods of different species vary as to their physical qualities; some of them are very hard and tough, others are lighter in weight, softer, and less tough[331 J]. The wood of many Oak species is a favoured fuel - burning well and giving off a lot of heat[331 J].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Whereas trees in the wild can reach 5 metres or more in height, they rarely exceed 1.5 metres in Britain[11]. Plants produce suckers[11] and often form thickets[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Trees produce heavy crops every year or every other year in the wild[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. This species is often confused with *Q. michauxii*, *Q. muehlenbergii* and *Q. prinus*[200]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 5.2.426 Malus halliana spontanea

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Malus halliana spontanea is a deciduous Tree growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is slightly larger than the type species, to 1cm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. This sub-species has slightly larger fruits than the type, they are up to 1 cm in diameter[200]. Hybridizes freely with other members of this genus[200]. The fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.427 *Hosta montana*

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Hosta montana* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves - cooked[116]. White part of the leaf stem - cooked[105].

tcanta None known  
dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A polymorphic species, it hybridizes freely with other members of this genus[200].

### 5.2.428 *Avena barbata*

Slender Oat  
4 tlin 8 cyuc 2 kcaak 2 tcan 0 dwat m hkuc htut cyutli hqatkyuctcup hwicli hyishrasjlutnykfrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Avena barbata* is a ANNUAL at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay and nutritionally

poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[57]. Rather small[257]. The seed ripens in the latter half of summer and, when harvested and dried, can store for several years. It has a floury texture and a mild, somewhat creamy flavour. It can be used as a staple food crop in either savoury or sweet dishes. The seed can be cooked whole, though it is more commonly ground into a flour and used as a cereal in all the ways that oats are used, especially as a porridge but also to make biscuits, sourdough bread etc. The seed can also be sprouted and eaten raw or cooked in salads, stews etc. The roasted seed is a coffee substitute.

tcanta Fibre Mulch Paper ThatchingThe straw has a wide range of uses such as for bio-mass, fibre, mulch, paper-making and thatching[171]. Some caution is advised in its use as a mulch since oat straw can infest strawberries with stem and bulb eelworm.

dwatta None known  
propta Seed - sow in situ in early spring or in the autumn. Only just cover the seed. Germination should take place within 2 weeks.

nwatta Succeeds in any moderately fertile soil in full sun[200]. A triploid species, it is rarely cultivated for its edible seed[57]. Oats are in general easily grown plants but, especially when grown on a small scale, the seed is often completely eaten out by birds. Some sort of netting seems to be the best answer on a garden scale.

### 5.2.429 *Lilium maculatum*

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Lilium maculatum* is a BULB growing to 0.6 m (2ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb - cooked[46, 61]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). Flower buds - cooked[105].

tcanta None known  
dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. This name possibly covers a group of hybrids involving *L. dauricum* x *L. concolor*[200]. Widely cultivated for ornament, there are many named varieties[58, 200]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

### 5.2.552 *Callirhoe digitata*

Finger Poppy Mallow, Winecup  
4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli kyuctcup hwicli hyishras hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Callirhoe digitata* is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[61, 177]. A pleasant taste[46, 105, 161].

tcanta None known  
dwatta None known

propta Seed - sow outdoors or in a cold frame. Plants resent root disturbance so the seed is best sown in situ in April[138], though the slugs will have a field day if you do not protect the plants[K]. If seed is in short supply then sow it in pots in a cold frame, putting a few seeds in each pot, and plant the pots out in early summer once the plants have put on at least 15cm of growth. Germination usually takes place within 1 - 6 months at 15°C[138]. Cuttings of young basal shoots in a frame in sand[1, 200]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division[200]. With care since the plant resents root disturbance. We have found that it is best not to disturb this plant and so do not try to divide it, relying instead on taking basal cuttings since these do not disturb the main clump[K].

nwatta Prefers a light rich sandy loam and a sunny position[1, 138]. This species is hardy to about -15c[200]. Plants resent root disturbance and should be planted into their final positions as soon as possible[138]. Slugs are strongly attracted to this plant and can destroy even established plants by eating out all the young shoots in spring[K].

### 5.2.553 *Panicum capillare*

Old Witch Grass, Witchgrass  
4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Panicum capillare* is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked whole or ground into a powder and used as a flour[257]. It is often mixed with corn[161, 177]. The seed is very small and fiddly to use, it has a mild flavour and can be used like millet[K]. In the wild, the seed stem breaks off when the seed is ripe and then blows away in the wind, scattering the seed[236].

tcanta BroomThe grass can be made into brooms[257].  
dwatta EmeticAn infusion of the leaves has been used as an emetic[257]. An infusion of the plant has been used as a reducing aid when dieting[257].

propta Seed - sown spring in a greenhouse and only just cover the seed. Germination should take place within a week. Prick out the seedlings into trays or individual pots and plant them out after the last expected frosts[200, K].

nwatta Requires a moderately fertile well-drained soil in full sun[200].

### 5.2.554 *Arisaema serratum*

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.9 m hkuc pcmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli nyanhjen hjonli

drutta *Arisaema serratum* is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Tuber - must be thoroughly dried or cooked[46, 61, 177]. The tubers are 15 - 55mm in diameter[266]. Use with caution, see the notes above on toxicity. Leaves - cooked[177]. Use with caution, see the notes above on toxicity.

tcanta None known  
dwatta Alternative Deobstruent Diuretic Expectorant VulneraryThe root is alternative, deobstruent, discutient, diuretic, expectorant, vulnerary[178, 218]. Use with caution[178].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog garden, woodland garden or a sheltered border in semi-shade[134, 200]. Prefers a loamy or peaty soil and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too hot or exposed[1, 200]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. A very polymorphic species[58]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

### 5.2.555 *Succisa pratensis*

Devil's Bit Scabious, Devilsbit  
4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwish-som hpa7tmwatli xre7t hjonli

drutta *Succisa pratensis* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - raw[7]. The tender young shoots are sometimes added to spring salads[7].

tcanta DyeA green dye is obtained from the leaves[7, 115].

dwatta Anthelmintic Demulcent Depurative Diaphoretic Diuretic Eczema Emmenagogue Expectorant Febrifuge StomachicThe herb is anthelmintic, demulcent, depurative, slightly diaphoretic, diuretic, emmenagogue, mildly expectorant, febrifuge and stomachic[4, 7, 9]. It makes a useful tea for the treatment of coughs, fevers and internal inflammations and is also a popular application externally to eczema and other cutaneous eruptions[4, 7]. A tincture of the plant is a gentle but reliable treatment for bruises, aiding quick re-absorption of the blood pigment[7]. The whole herb is collected in early autumn and dried for later use[4]. Good

## 5.2.549 Hosta crispula

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hosta crispula is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: StemEdible Uses: Leaf stems - raw or cooked[K]. Crisp and sweet but rather fibrous and chewy[K].

tcanta A good ground cover plant[197]. Plants should be spaced about 45cm apart each way[208].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Another report says that the plant should be grown in full shade[251]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Requires some protection from the wind[188, 251]. A very slow-growing plant[251], it is in general fully hardy in Britain, but the young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. This plant is not recognised as a species by some authorities, who see it as a garden hybrid H. 'Crispula'[251]. Especially when grown in less than ideal conditions, this species is easily confused with H. 'Thomas Hogg' and H. fortunei 'Albomarginata'[200]. Hybridizes freely with other members of this genus[200]. There are some named forms selected for their ornamental value[200]. This species is prone to virus disease[188, 251].

## 5.2.550 Arisaema amurense

Tian Nan Xing

4 tlin 8 cyuc 2 kcaok 0 tcan 3 dwat 0.5 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Arisaema amurense is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils.

It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves RootEdible Uses: Well-soaked roots can be boiled, peeled and eaten[177]. The tuber is 6 - 7 cm in diameter[266]. Some caution is advised, see the notes above on toxicity. Young leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Anodyne Antispasmodic Cancer Epilepsy Expecto- rant VermifugeTian Nan Xing has been used in Chinese herbal medicine for thousands of years and is valued especially for its beneficial affect upon the chest[254]. When prescribed internally it is always used dried and in conjunction with fresh ginger root[254]. The root is an acrid irritant herb that is anodyne, antibacterial, antifungal, antiphlogistic, anti-rheumatic, anticancer, antispasmodic, antitumor, expecto- rant, sedative and stomachic[147, 176, 218, 238, 279]. The dried root is used internally in the treatment of coughs with profuse phlegm, tumours, cervical cancer, epilepsy, tetanus and complaints involving muscular spasms[176, 238]. The fresh root is applied externally as a poultice to ulcers and other skin complaints[254]. The root is harvested when the plant is dormant in the autumn or winter and is dried for later use[238].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a coupe of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog, woodland garden or a sheltered border in semi-shade[200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. This species is well suited to the front of a peat border[200]. Tubers should be planted about 15cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants require protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

## 5.2.551 Cardamine fauriei

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 0.3 m hkuc

hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine fauriei is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta Edible Parts: Leaves RootEdible Uses: Leaves - raw[105, 177]. Added to salads. A hot, watercress flavour. Root[105, 177]. No further details are given.

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts

## 5.2.430 Ulmus macrocarpa

4 tlin 8 cyuc 2 kcaok 0 tcan 1 dwat m hkuc

hmimhtut cyutli kyucup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ulmus macrocarpa is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

ckakta Edible Parts: Fruit LeavesEdible Uses: Leaves - raw or cooked. The fruits are eaten in sauces. An emergency food, they are only used when all else fails[177].

tcanta Parasiticide Parasiticide WoodUsed externally on body parasites[178]. No more details.

dwatta Anthelmintic Antidote Astringent Digestive Parasiticide Parasiticide SkinThe seed is anthelmintic, antidote, digestive, febrifuge, parasiticide, skin[178, 218]. The bark contains tannins. It is astringent and antimicrobial activities[279]. It is used in the treatment of chronic diarrhoea and internal parasites[279].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. This species is resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200].

## 5.2.431 Stellaria media

Chickweed, Common chickweed

4 tlin 11 cyuc 2 kcaok 2 tcan 3 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Stellaria media is a ANNUAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower all year, and the seeds ripen all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked as a potherb[2, 7, 9, 12, 52, 54, 183]. They can be available all year round if the winter is not too severe[85]. Very nutritious, they can be added to salads whilst the cooked leaves can scarcely be distinguished from spring spinach[4, K]. The leaves contain saponins so some caution is advised, see the note on toxicity at the top of the page. A nutritional analysis is available[218]. Seed - ground into a powder and used in making bread or to thicken soups[172,

183]. It would be very fiddly to harvest any quantity of this seed since it is produced in small quantities throughout most of the year and is very small[K]. The seed contains 17.8% protein and 5.9% fat[218].

tcanta A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antirheumatic Astringent Carmarative Demulcent Depurative Diuretic Emmenagogue Expecto- rant Galactogogue Kidney Laxative Ophthalmic Poultice Refrigerant TB VulneryChickweed has a very long history of herbal use, being particularly beneficial in the external treatment of any kind of itching skin condition[238]. It has been known to soothe severe itchiness even where all other remedies have failed[254]. In excess doses chickweed can cause diarrhoea and vomiting[254]. It should not be used medicinally by pregnant women[254]. The whole plant is astringent, carminative, demulcent, diuretic, expecto- rant, laxative, refrigerant, vulnery[4, 7, 9, 21, 54, 165, 222]. Taken internally it is useful in the treatment of chest complaints and in small quantities it also aids digestion[254]. It can be applied as a poultice and will relieve any kind of roseola and is effective wherever there are fragile superficial veins[7]. An infusion of the fresh or dried herb can be added to the bath water and its emollient property will help to reduce inflammation - in rheumatic joints for example - and encourage tissue repair[254]. Chickweed is best harvested between May and July, it can be used fresh or be dried and stored for later use[4, 238]. A decoction of the whole plant is taken internally as a post-partum depurative, emmenagogue, galactogogue and circulatory tonic[218]. It is also believed to relieve constipation and be beneficial in the treatment of kidney complaints[244]. The decoction is also used externally to treat rheumatic pains, wounds and ulcers[4, 218, 222]. The expressed juice of the plant has been used as an eyewash[244].

propta Seed - this species should not need any encouragement, you are much more likely to be trying to get rid of it than trying to introduce it (eating it is one way of doing that!)[K].

nwatta A very easily grown plant, it prefers a moist soil and a position in full sun or partial shade[52, 238]. It can be very lush and vigorous when grown in a fertile soil[1], but in infertile soils it will flower and set seed whilst still very small. A very common garden weed, chickweed grows, flowers and sets seed all year round. The flowers open around 9 o'clock in the morning and remain open for about 12 hours[4]. They do not open in dull weather[4]. The leaves fold up of a night time, enfolding and protecting the tender buds of new shoots[4]. A food plant for the caterpillars of many butterfly species. Special Features: Edible, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A self-seeding annual [1-2]. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.2.432 Dactylorhiza maculata

Spotted Orchid

4 tlin 8 cyuc 2 kcaok 0 tcan 2 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Dactylorhiza maculata is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: RootEdible Uses: Root - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a

drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Succeeds in most soils, but it prefers a moist loam and lots of leaf mould[42]. Requires a deep rich soil[1]. Grows well in full sun or partial shade[42], doing well in a woodland garden[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Cultivated plants are very susceptible to the predation of slugs and snails[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1].

### 5.2.433 *Aralia mandschurica*

Manchurian Angelica Tree

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Aralia mandschurica* is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid,

neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young shoots - cooked. They can also be blanched and used in salads.

tcanta None known

dwatta Anodyne Carminative TonicAnodyne, carminative. The root, and especially the bark, stimulates the central nervous system[218]. The plant is said to restore the appetite, memory, vigour etc[218].

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Prefers a good deep loam and a position in semi-shade. Requires a sheltered position. Plants are hardier when grown on poorer soils. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This plant is very closely related to *A. elata* and is included in that species by many botanists[58].

### 5.2.434 *Crataegus rivularis*

River Hawthorn

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrp hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

drutta *Crataegus rivularis* is a deciduous Tree growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in highly clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[212]. The flesh is thin, dry and mealy[227]. The fruit can also be dried for later use or for making into pemmican[212]. The fruit is high in sugar but low in fats and protein[212]. The fruit is about 10mm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a

soils. It cannot grow in the shade. It prefers moist or wet soil.

kcaakta Edible Parts: RootEdible Uses: DrinkRoot - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Antiflatulent Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Prefers a sunny position and a good limey loam soil[42]. Requires a deep rich soil[1]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1]. Plants seem to be immune to the predations of rabbits[233]. The flowers diffuse a powerful almond-like scent[245]. Cultivated plants are very susceptible to the predation of slugs and snails[230].

### 5.2.547 *Oenothera albicaulis*

Whitest Evening Primrose

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc

htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikliw hpa7tmwatli fyifkre7t hjonli

drutta *Oenothera albicaulis* is a ANNUAL/BIENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves Root Seed SeedpodEdible Uses: Fruit[105, 161]. Another report says that the plant has an edible seedpod[213]. The reports for edible fruit probably mean the seedpod[K]. Seed - cooked[257]. It can be used in soups or can be ground into a powder and then used as a gravy[257]. Root - cooked. Too small to be a staple food, but useful in an emergency, the roots taste best in late autumn, winter and early spring[213]. Leaves and young shoots - cooked[213].

tcanta None known

dwatta AntiphlogisticA poultice of the plant has been used to treat swellings[257]. A decoction of the root has been drunk and used as a lotion on muscle strains[257].

propta Seed - sow in situ from late spring to early summer or in the autumn[200].

nwatta Prefers a dryish well-drained sandy loam and full sun[1, 200]. Heavy clay soils may induce winter rots[200]. Succeeds in poor soils[200]. The flowers open in the evening, they are richly scented and are very attractive to moths.

### 5.2.548 *Prunella grandiflora*

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

drutta *Prunella grandiflora* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[46, 61, 105]. A mild flavour[K].

tcanta Can be used as a ground cover plant in a sunny position or light shade[188, 197]. It requires weeding for the first year or so[197]. They are best spaced about 45cm apart each way[208]. Plants have not been a reliable ground cover in Cornwall, often dying after flowering, though they usually self-sow[K].

dwatta None known

propta Seed - sow in mid spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed then it can be sown outdoors in situ in mid to late spring. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Thrives in any damp soil in a shady position[1, 111] or in full sun[200]. Plants are hardy to about -25°C[187]. The sub-species *P. grandiflora pyrenaica* has larger flowers and is found wild on acid soils whilst the type species is usually found on alkaline soils[187]. Plants tend to be short-lived, often dying out after flowering heavily in the summer[208]. Fortunately, they will usually self-sow freely[K]. Most plants are hermaphrodite but sometimes male plants are found.



## 5.2.543 *Arabis caucasica*

Rock Cross, Wall Rockcross

4 tlin 9 cyuc 2 kcaak 3 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyishrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Arabis caucasica* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from January to May, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: The leaves are used as a garnish in much the same way as watercress[183]. They are also sometimes used as a potherb[183].

tcanta A good ground cover plant for sunny positions[188, 197], forming a carpet[208].

dwatta None known

propta Seed - it is best to surface sow the seed as soon as it is ripe in a light position in a cold frame[134]. Seed can also be sown in spring. It usually germinates in 2 - 3 weeks at 21°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering[111]. Very easy, the divisions can be planted out straight into their permanent positions if required. Cuttings in a shady border in summer[1].

nwatta Landscape Uses:Alpine garden, Border, Ground cover, Rock garden. Easily grown in ordinary well-drained soil[1]. Prefers a poor soil[187]. Succeeds in partial shade[134] though it tends to become straggly[197]. Established plants are very tolerant of drought and grow very well on a dry bank[190], they also succeed when grown in walls[219, K]. A very ornamental plant[1], it is hardy to about -15°c[187], but can be rather invasive[200]. There are some named varieties selected for their ornamental value[187]. A good butterfly and moth plant[30]. Bees are attracted to the flowers. Plants resent root disturbance and are best put in their final positions whilst still small[134]. This species is closely related to *A. alpina*[200]. Special Features: Attractive foliage. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 5.2.544 *Arisaema utile*

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Arisaema utile* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and flowering spathes - cooked as a potherb[272].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog garden, woodland garden or a sheltered border in semi-shade[90, 134, 200]. Prefers a loamy or peaty soil and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too hot or exposed[1, 200]. Tubers should be planted about 10cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Closely related to *A. griffithii*[272]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

## 5.2.545 *Potentilla recta*

Rough-Fruited Cinquefoil, Erect cinquefoil

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta *Potentilla recta* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[207]. The unripe fruit is almost as pleasant as the fully ripe fruit[207].

tcanta None known

dwatta AstringentThe whole plant is astringent[257]. A poultice of the pounded leaves and stems has been applied to open sores and wounds[257].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an acid soil[200]. Plants produce more foliage but flower less freely when grown in a rich soil[200]. Hardy to about -25°c[200]. There is at least one named variety selected for its ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.546 *Orchis ustulata*

Dark-Winged Orchis

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Orchis ustulata* is a BULB growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline

cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. There is some doubt over the correct name for this species. [200] suggests that it is a synonym for *C. douglasii* but also records it as a distinct species[K]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 5.2.435 *Aronia arbutifolia*

Red Chokeberry

4 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Aronia arbutifolia* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. It can also be dried and used for making pemmican[161, 183]. Fruit quality is rather variable, some forms are rather pleasant when fully ripe, especially if they have experienced some frost[2]. The fruit is about 7mm in diameter[200], it can hang on the plant for several months[235].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in pots outdoors or in a cold frame[113]. Pre-soaked seed overnight and then cold stratify for 3 months at 2°c[113]. The seed germinates in 1 - 3 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring. Cuttings of half-ripe wood, July/August in a frame[113]. Division of suckers in the dormant season[200]. Very easy, they can be planted straight out into their permanent positions. Layering[200].

nwatta Landscape Uses:Border, Erosion control, Foundation, Pest tolerant, Massing, Seashore, Specimen, Woodland garden. Prefers a moist peaty soil in full sun or partial shade[134]. Succeeds in most soils[1] but dislikes shallow chalk[200]. Tolerates atmospheric pollution[227]. Plants are hardy to about -25°c[184]. This genus is closely related to *Sorbus* species[200]. A suckering plant, it forms thickets in the wild[182]. Some named forms have been developed for their ornamental value[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Wetlands plant, Attracts butterflies. The plant is heat tolerant in zones 8 through 4. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants

would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 5.2.436 *Cornus sanguinea*

Dogwood, Bloodtwig dogwood

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Cornus sanguinea* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Oil OilEdible Uses: Oil OilFruit - raw or cooked[105]. A bitter flavour, it can also have an emetic effect on the body[1, 7, 11]. It is not worthwhile[115]. The fruit is about 8mm in diameter[200]. An oil is obtained from the seed[2], it is edible when refined[75].

tcanta Basketry Charcoal Dye Fuel Hedge Hedge Oil Oil WoodThe seed contains 45% of a non-drying oil[74], it is used in soap making and lighting[7, 13, 100, 115, 177]. A non-drying oil is also obtained from the pericarp, it is used for lighting[74]. The pericarp contains 19 - 35% oil[74]. A greenish-blue dye is obtained from the fruit[13, 74]. The young stems are very flexible and are used in basketry[7, 13, 74, 100]. Wood - tough, hard. Used for small items such as tool handles, turnery etc[11, 61, 115]. A good quality charcoal is obtained from the wood[115], the wood also makes an excellent fuel[115].

dwatta Astringent Emetic FebrifugeThe bark is astringent and febrifuge[7]. It is used to treat fevers[254]. The leaves are sometimes used externally as an astringent[7]. The fruit is emetic[7].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of struck seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Plants are relatively shade tolerant, though they are not happy when growing in dense shade[186]. They grow badly when exposed to strong cold winds[186]. Plants are hardy to about -25°c[184]. The flowers have a rather unpleasant smell to most people, though they are attractive to insects[186]. Plants have a suckering habit and can quickly form dense thickets[186]. They can be coppiced regularly and will throw

up long straight stems after being cut back[186]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.437 Quercus undulata

Wavyleaf Oak  
4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikwiss hpa7tmwatli hjonli

drutta Quercus undulata is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[61, 105, 161, 257]. Up to 2cm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[257].

tcanta Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Tannin is obtained from the bark[46, 61]. Wood. Used mainly as a fuel[46, 61].

dwatta Analgesic Astringent DysenteryA decoction of the root bark has been used to treat internal pains[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The seed ripens in its first year[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.438 Crataegus uniflora

Dwarf hawthorn  
4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus uniflora is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[161, 177]. The fruit is about 10mm in diameter and is borne in small clusters[200]. The fruit is usually borne singly, or in groups of up to 3 fruits[235]. It can be up to 16mm in diameter and has a firm flesh[235]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This species is often confused with *C. tomentosa*. L.[235]. It hybridizes freely with other members of the genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 5.2.439 Angelica atropurpurea

Purplestem Angelica  
4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 3 m hkuc

### 5.2.541 Hemerocallis forrestii

4 tlin 8 cyuc 2 kcak 0 tcan 1 dwat 0.4 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyikfrip hpa7tli flatprikwiss hpa7tmwatli xre7t hjonli

drutta Hemerocallis forrestii is an evergreen Perennial growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked. Root - raw or cooked. The roots are swollen and conspicuously enlarged at each end[200]. The roots are slightly fleshy, with a large, globose, swollen, tuberous part near the tip[266].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Antidote DiureticThe juice of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil[205]. Grows well in heavy clay soils. Succeeding in sun or shade, it produces more flowers in a sunny position though these flowers can be shorter-lived in very sunny positions[205]. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Some reports say that this species is not hardy in Britain[205], whilst another says that it is hardy to zone 5 (tolerating quite heavy frosts[200]). There is a plant at Kew Botanical Gardens that bears this name and appears to be fully hardy, growing near the base of a west-facing brick wall[K]. It is possible that the plant is actually a hybrid *H. forrestii* x *H. middendorffii*[205]. Hybridizes freely with other members of this genus[200]. Individual flowers are very short-lived, usually withering within 24 hours of opening. The plants produce a succession of blooms over a period of a month or more[205]. Plants take a year or two to become established after being moved[1]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200].

### 5.2.542 Calluna vulgaris

Heather, Scotch Heather

4 tlin 7 cyuc 2 kcak 5 tcan 2 dwat 0.6 m hkuc  
hmimhtut cyutli kyuctup hwicli hyishrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Calluna vulgaris is an evergreen Shrub growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from July to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), wind. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and can grow on nutritionally poor soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: Condiment TeaA tea is made from the flowering stems[177, 183]. A kind of mead was once brewed from the flowers and the young shoots have been used instead of hops to flavour beer[7, 183].

tcanta Basketry Besom Dye Fuel Hedge Hedge Insulation Musical Tannin ThatchingThe branches have many uses, including in thatching, as a bedding or a stuffing for mattresses, for insulation, basketry, rope making and for making brooms[6, 7, 11, 46, 61, 66, 100, 254]. The dried branches are a good fuel[6, 66]. The rootstock can be made into musical pipes[254]. A yellow dye is obtained from the plant[7, 46, 61]. The bark is a source of tannin[46]. Heather can be grown as a low hedge and is quite useful as an edging to beds. It is fairly amenable to trimming[29]. A useful ground cover plant for covering dry banks[188, 197]. The cultivar 'White Lawn' has been recommended[188]. All except the very dwarf cultivars will need trimming each spring in order to keep them compact[208].

dwatta Antianxiety Antirheumatic Antiseptic Bach Cholagogue Depurative Diaphoretic Diuretic Expectorant Sedative Urinary VasoconstrictorHeather has a long history of medicinal use in folk medicine. In particular it is a good urinary antiseptic and diuretic, disinfecting the urinary tract and mildly increasing urine production[254]. The flowering shoots are antiseptic, astringent, cholagogue, depurative, diaphoretic, diuretic, expectorant, mildly sedative and vasoconstrictor[7, 8, 9, 21, 165, 238]. The plant is often macerated and made into a liniment for treating rheumatism and arthritis, whilst a hot poultice is a traditional remedy for chilblains[7, 254]. An infusion of the flowering shoots is used in the treatment of coughs, colds, bladder and kidney disorders, cystitis etc[9, 238, 254]. A cleansing and detoxifying plant, it has been used in the treatment of rheumatism, arthritis and gout[254]. The flowering stems are harvested in the autumn and dried for later use[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Self-centredness' and 'Self-concern'[209]. A homeopathic remedy is made from the fresh branches[9]. It is used in the treatment of rheumatism, arthritis and insomnia[9].

propta Seed - sow as soon as it is ripe or in February in a shaded part of the greenhouse[78, 113]. Surface sow or only just cover the seed[113, 138]. Cold stratification for 4 - 20 weeks aids germination[138]. The seed usually germinates in 1 - 2 months at 20°C. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 4 - 5cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 5 - 7cm with a heel, October/November in a frame. Good percentage[78]. Layering in autumn[78]. Division in spring. Dig up the plant 12 months prior to division and re-plant it 15 - 30cm deeper in the soil in order to encourage rooting along the stems. When ready to take the divisions, it is just a matter of digging up the plant and cutting off sections of stem with roots on them. These are best potted up and kept in a cold frame or greenhouse until they are well rooted before planting them out in the summer or following spring.

nwatta Landscape Uses:Alpine garden, Border, Foundation, Ground cover, Massing, Rock garden, Specimen. Requires a light acid soil and a sunny position[138, 182]. Prefers a sunny position but tolerates light shade[186]. Only succeeds if the pH is below 6.5[186]. Prefers a poor peaty soil[11]. Plants are tolerant of fairly dry soils but they dislike prolonged drought[186]. They tolerate wet conditions in the winter[238]. Plants regenerate well from the base after a fire if the heat was not too great, if the fire was slow and intense then new seedlings will quickly become established[186]. Commonly grown in the ornamental garden, there are many named varieties[200, 238]. The flowers are rich in nectar and are very attractive to bees, butterflies and moths[7, 11, 30]. This plant is also an important food source for the caterpillars of many lepidoptera[30]. Special Features:Attractive foliage, Not North American native, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: CondimentYoung leaves - cooked[177]. The radical leaves are said to be slightly toxic so only the top leaves should be used. Old leaves are powdered and used as a flavouring. Root - cooked[177]. Eaten in soups as a tonic vegetable[238]. It is also peeled and pickled or preserved in sugar[218]. A nutritional analysis is available[218].

tcanta None known

dwatta Anthelmintic Anticholesterolemic Antiphlogistic Antitussive Astringent Expectorant Haemolytic Hypoglycaemic Sedative Stomachic TonicThis species has a history of herbal use in China going back over 2,000 years and modern clinical tests have demonstrated its efficacy[218, 238]. It is widely used there in patent remedies and is also made into cough tablets[238]. The root contains saponins and is anthelmintic, antiasthmatic, anticholesterolemic, antiphlogistic, antitussive, astringent, carminative, expectorant, haemolytic, hypoglycaemic, sedative, stomachic, tonic and vermifuge. It lowers blood sugar and cholesterol levels in the liver and inhibits the release of histamine[116, 147, 174, 176, 178, 218, 238, 279]. It is used internally in the treatment of coughs with profuse phlegm, colds, bronchitis, pleurisy, pulmonary abscesses and throat infections[176, 238]. It is also used to treat hypertension and diabetes in Korea[279]. The root of plants 2 - 3 years old are harvested in the spring or autumn, peeled and used fresh or dried[238].

propta Seed - sow spring in a cold frame[111]. Free and quick germination[K]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the winter when the plants are dormant[238, K]. Basal cuttings of non-flowering shoots in spring, preferably with a piece of root attached[188]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Container, Rock garden, Specimen. An easily grown plant, it succeeds in any good well-drained garden soil but prefers a light more or less sandy soil in a sunny position or light dappled shade[200]. Plants are hardy to about -15°c[200]. Another report says it is hardy to -20°c[187]. A very ornamental and long-lived plant[1, 233], there are several named forms[238]. It is cultivated, especially in China, as a medicinal plant[61, 238]. This species has brittle roots and strongly resents root disturbance. It should be planted out in its permanent position as soon as possible, and preferably when dormant in the winter[111, 238]. Special Features: Suitable for cut flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 5.2.539 Symphytum tuberosum

Tuberous comfrey

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrp hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Symphytum tuberosum is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower

from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CoffeeWhen roasted until brown and brittle, and then finely ground, the root is used as a coffee substitute. It has a smoothness that is not found in real coffee[183].

tcanta A good, and sometimes rampant, ground cover plant for a shady border or woodland.

dwatta None known

propta Seed - sow spring or autumn in a cold frame.

When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed you can try an outdoor sowing in situ in the spring. Division succeeds at almost any time of the year. Simply use a spade to chop off the top 7cm of root just below the soil level. The original root will regrow and you will have a number of root tops, each of which will make a new plant. These can either be potted up or planted out straight into their permanent positions.

nwatta Tolerates most soils and situations but prefers a moist soil and some shade. Grows well in heavy clay soils. Hardy to about -20°c[187]. Plants form extensive patches, spreading by means of a creeping tuberous rhizome[187]. Plants are dormant in summer[187].

### 5.2.540 Acinos arvensis

Basil Thyme

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.2 m hkuc htut cyutli kyuctcup hwicli hyishrasjltut hpa7tli flatprikkwisslip hpa7tmwatli fyfjxre7t hjonli

drutta Acinos arvensis is a ANNUAL/PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment-The flowering tops are used as a flavouring[4, 177, 183] and in salads[238]. Said to be similar to thyme in odour but milder and more pleasant[183]. The plant is only faintly aromatic and does not really make a very good substitute for thyme[238, K].

tcanta The plant makes a good ground cover[244].

dwatta Diuretic Odontalgic Rubefacient StomachicBasil thyme was a great favourite of the ancient herbalists, though it is little used medicinally at present[4]. The herb is diuretic, odontalgic, rubefacient and stomachic[4, 61, 238]. The essential oil has been applied externally as a rubefacient, whilst one drop of it put into a decayed tooth is said to alleviate the pain[4]. The plant has also been added to bath water, especially for children, and is said to be a strengthener and nerve soother[4]. The flowering plant is harvested in the summer and is normally used fresh in infusions[238].

propta Seed - sow early spring in a cold frame. If you have sufficient seed then you could try sowing in situ in April or May. Germination should take place within a month. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Basal cuttings in late spring. Very easy[K].

nwatta Succeeds in any well-drained soil[244], though it prefers a light well-drained dry soil in full sun[1, 238]. Prefers sandy and alkaline growing conditions[238]. Dislikes shade. A very hardy plant, tolerating temperatures down to at least -15°c[238]. A short-lived perennial, but the plants usually self-sow when they are growing in a suitable position[238].

hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikkwis hpa7tmwatli fyfjxre7t hjonli

drutta Angelica atropurpurea is a PERENNIAL growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root StemEdible Uses: Young shoots and leaf stalks - raw or cooked[55, 105, 177]. When boiled in two lots of water they form a vegetable that strongly resembles celery. They can be peeled and eaten in salads or blanched and cooked like asparagus[183]. The stems can also be candied and used as a sweetmeat[2]. Root, leafstalks and stems - candied[177, 183].

tcanta None known

dwatta Carminative Diaphoretic Emmenagogue Sedative Stomachic TonicA tea made from the leaves is carminative and stomachic[222]. It is also used in the treatment of colds, rheumatism etc[222]. The seed and roots can also be used and have a stronger effect[222]. The plant has similar properties to angelica, A. archangelica, though it is inferior since it is less aromatic[4]. The root is carminative, diaphoretic, emmenagogue, sedative, stomachic and tonic[257]. An infusion has been used in the treatment of fevers, colds, flatulent colic and other stomach disorders, obstructed menses and as a general tonic for women[257]. Externally it has been used as a gargle for sore throats and mouths and as a poultice for broken bones, swellings etc[257]. It has also been used, both internally and externally, as a treatment for rheumatism[257].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sow in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[200]. Plants are reliably perennial if they are prevented from setting seed[200].

### 5.2.440 Eleutherococcus spinosus

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hyishrasjltunyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Eleutherococcus spinosus is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: TeaLeaves and young budings - cooked[46, 61, 105, 116, 177]. The dried leaves are a tea substitute[105, 177]. Although we have no record of the seed being edible, it is said to contain 5.6 - 30.6% protein, 5.6 - 36.6% fat and 2.1 - 3.5% ash[218].

tcanta Hedge HedgePlants can be used as a hedge[200]. dwatta Antirheumatic TonicThe cortex of the root is tonic and analgesic. It is used to treat general debility, rheumatic pains and many other complaints[178, 218]. A wine made from the root is considered to be a general tonic for restoring vigour and restoring sexual potency[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of

ripe wood of the current season’s growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Prefers a light warm open loamy humus-rich soil and a position sheltered from north and east winds[11, 200]. Prefers a well-drained soil and full sun[200]. Tolerates urban pollution and poor soils[200]. Plants are hardy to at least -15°c if they are sheltered from cold winds[200]. Considered to be a part of E. sieboldianus by some botanists, but this species has smaller leaves[200]. It is closely related to and often confused with E. divaricatus[200]. There is a spineless form of this species, known as Eleutherococcus spinosus inermis (Makino) H. Ohashi[275].

### 5.2.441 Helianthus petiolaris

Prairie Sunflower

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 3 m hkuc

htut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Helianthus petiolaris is a ANNUAL growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked. An oily texture[161, 177]. The seed can be ground into a powder and kneaded into seed butter[257].

tcanta None known

dwatta SalveThe powdered leaves, either on their own or in an ointment, have been used as a dressing for sores and swellings[257].

propta Seed - sow in mid spring in situ. An earlier start can be made by sowing 2 - 3 seeds per pot in a greenhouse in early spring. Use a fairly rich compost. Thin to the strongest seedling, give them an occasional liquid feed to make sure they do not become nutrient deficient and plant them out in late spring or early summer.

nwatta Succeeds in most soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. Grows well on dry soils[200]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[24]. This species hybridizes in the wild with H. annuus[274]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 5.2.442 Rubus affinis

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Rubus affinis is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Large[150].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°c and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[11, 200]. Hardy to at least -15°c. This species is a blackberry with biennial stems[200]. New shoots are produced from the roots each year, these flower and fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.443 Malus brevipes

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Malus brevipes is a deciduous Tree growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177].

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.444 Aronia prunifolia

Purple Chokeberry

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aronia prunifolia is a deciduous Shrub growing to 3 m (9ft) by 2.5 m (8ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - dried and used for making pemmican. The fruit is about 8mm in diameter[200].

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in pots outdoors or in a cold frame[113]. Pre-soak stored seed overnight and then cold stratify for 3 months at 2°c[113]. The seed germinates in 1 - 3 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring. Since this species is believed to be a hybrid it will probably not breed true from seed. Cuttings of half-ripe wood, July/August in a frame[113]. Division of suckers in the dormant season[200]. Very easy, they can be planted straight out into their permanent positions. Layering[200].

nwatta Prefers a moist peaty soil in full sun or partial shade[200]. Succeeds in most soils but dislikes shallow chalk[200]. Plants are hardy to about -25°c[200]. This genus is closely related to Sorbus species[200]. Plants in this genus are notably resistant to honey fungus[200]. This species is probably a naturally occurring hybrid, A. arbutifolia x A. melanocarpa[200].

### 5.2.445 Polygonum sachalinense

Giant Knotweed

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 3.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Polygonum sachalinense is a PERENNIAL growing to 3.6 m (11ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). - The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Seed StemEdible Uses: Young shoots in spring - raw or cooked[46, 61, 116, 183]. They can be added to salads or cooked as an asparagus substitute[183]. They have an acid flavour and we find that they are more like a rhubarb substitute. Older stems and shoot tips - cooked. The stems are best peeled. Tasting like a mild version of rhubarb, they have a superior quality with a hint of lemon in the flavour[183]. Seed - cooked[105]. The seed can be ground into a powder and used as a thickener and flavouring in soups etc, or as an extender in flour. It is rather small and fiddly to utilize.

tcanta BiomassA potential source of biomass. Plants are very vigorous and could be grown as a ground cover[208].

dwatta None known

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in ordinary garden soil in sun or shade[1, 111]. Hardy to about -25°c[187]. An extremely invasive plant, capable of sending up new shoots at a considerable distance from the main clump[1]. Considered a pest in many areas, if grown in the garden it should be planted within a barrier to contain its roots. Plants seem to be immune to the predations of rabbits[233]. Dioecious, male and female plants must be grown if seed is required.

### 5.2.446 Calystegia sepium

Hedge Bindweed, Hedge false bindweed, Appalachia false bindweed, Bingham's false bindweed

4 tin 8 cyuc 2 kcaak 1 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Calystegia sepium is a PERENNIAL CLIMBER growing to 3 m (9ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Stalks and root - cooked[2, 46, 128, 153]. Washed and steamed[179]. A pleasant sweet taste[178]. Rich in starch and sugars, it is very nutritious[179]. It should not be eaten

snake bites[147]. The juice of the plant, mixed with butter, is applied to muscular swellings, boils and pimples[272]. An infusion can be used as a wash to rid children of hookworms[257]. The plant is a good source of vitamin C and is used as an antiscorbatic in the treatment of scurvy[240]. The leaves are used as an antidote to poisoning by the seeds of Datura spp, arsenic and mercury[218]. The leaf juice is applied to insect bites, burns and skin eruptions[218]. It has an antibacterial activity[218].

propta Seed - best sown as soon as ripe in a cold frame. This plant does not need any encouragement.

nwatta A very easily grown plant, succeeding in a sandy soil in a warm dry position[1]. It prefers dry open habitats[50]. Spreading rapidly by seed and underground bulbils, this species can quickly become a nuisance, it is a common weed of pot plants in nurseries[200].

### 5.2.535 Chrysosplenium oppositifolium

Golden Saxifrage

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tucpha7n hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Chrysosplenium oppositifolium is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 5, 8, 17, 52, 61, 66]. Added to salads or soups[183]. The leaves are rather small, and there is a distinct bitterness in the flavour, especially in hot weather[K].

tcanta The plants creeping habit makes it a good ground cover for the bog garden[200].

dwatta None known

propta Seed - sow spring or autumn in a lightly shaded position in a cold frame. Stand the pot in 2cm of water. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a tray of water in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in light shade in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Succeeds in most soils if they are moist. Requires a constantly wet but well-drained soil[200]. Prefers a shady position, succeeding in woodland[17, 200].

### 5.2.536 Lamium purpureum

Red Dead Nettle, Purple deadnettle

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Lamium purpureum is a ANNUAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked as a potherb[2, 4, 5, 8, 54, 62, 183]. The plant is a short-lived annual, but seeds can germinate at almost any time of the year and so the leaves are often available all year round.

tcanta None known

dwatta Astringent Diaphoretic Diuretic Purgative Styp-ticThe whole plant is astringent, diaphoretic, diuretic, purgative and stypitic[4, 46]. A decoction of the plant is particularly useful for checking any kind of haemorrhage, whilst the fresh bruised leaves can be applied to external cuts and wounds[4].

propta Seed - plants usually self sow freely and should not require human intervention. When required, the seed can be sown in situ as soon as it is ripe.

nwatta An easily satisfied plant, it tolerates most soils and conditions. Grows well in heavy clay soils. Dislikes shade. A common garden weed, usually flowering at almost any time of the year and the seed is capable of germinating even in the winter if the weather is mild[17]. In rich soils the plant can grow quite lushly, in poor soils it will only grow a few centimetres tall before flowering and spreading its seed. The plant is easily controlled, however, and never really becomes a pest[K]. Plants seem to be immune to the predations of rabbits[233]. A good bee plant[4, 24]. Grows well with potatoes[14].

### 5.2.537 Oxalis exilis

Least Yellow Sorrel, Shady woodsorrel

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.1 m hkuc htut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Oxalis exilis is a ANNUAL/PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[2, 46, 61, 105]. Added to salads, cooked as a potherb with other milder flavoured greens or used to give a sour flavour to other foods[183]. The leaves are available all year round unless the winter is very cold, they have a pleasantly sour taste[114], but are very small and fiddly to harvest[K]. The leaves contain about 86% water, 2.3% protein, 0.8% fat, 8.2% carbohydrate, 150mg calcium, 78mg phosphorus, 8mg iron, 0.6mg niacin, 78mg vitamin C, 6050µg beta carotene[173]. The leaves contain between 7 - 12% oxalate[218]. Use in moderation, see notes at top of sheet. Flowers - raw. A nice acid flavour and a pleasant addition to the salad bowl[K].

tcanta None known

dwatta Urinary Vitamin CThe whole plant is ant-helmintic, antiphlogistic, astringent, depurative, diuretic, emmenagogue, febrifuge, lithontrpic, stomachic and styp-tic[147, 178, 218, 240]. It is used in the treatment of influenza, fever, urinary tract infections, enteritis, diarrhoea, traumatic injuries, sprains and poisonous snake bites[147]. An infusion can be used as a wash to rid children of hookworms[257]. The plant is a good source of vitamin C and is used as an antiscorbatic in the treatment of scurvy[240]. The leaves are used as an antidote to poisoning by the seeds of Datura spp, arsenic and mercury[218]. The leaf juice is applied to insect bites, burns and skin eruptions[218]. It has an antibacterial activity[218].

propta Seed - best sown as soon as ripe in a cold frame. This plant does not need any encouragement.

nwatta A very easily grown plant, succeeding in a sandy soil in a warm dry position[1]. It prefers dry open habitats[50]. Spreading rapidly by seed and underground bulbils, this species can quickly become a nuisance, it is a common weed of pot plants in nurseries[200].

### 5.2.538 Platycodon grandiflorus

Balloon Flower

4 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Platycodon grandiflorus is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and

dwatta Horsetails have an unusual chemistry compared to most other plants[238]. They are rich in silica, contain several alkaloids (including nicotine) and various minerals[238].

propta Spores - best collected as soon as they are ripe in the spring and surface-sown immediately on a sterile compost. Keep moist and pot up as soon as the plants are large enough to handle. Very difficult[200]. Division. The plants usually spread very freely when well sited and should not really need any assistance.

nwatta Prefers a moist soil with a pH between 6.5 and 7.5[200]. Plants are hardy to about -30°c[200]. Plants have a deep and penetrating root system and can be invasive. If grown in the garden they are best kept in bounds by planting them in a large container which can be sunk into the ground[200].

### 5.2.532 Thymus pannonicus

Eurasian thyme

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli hgatkycuycup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Thymus pannonicus is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: CondimentThe leaves are sometimes used as a condiment[183]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

### 5.2.533 Campanula lasiocarpa

Mountain harebell

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc htut cyutli tcup hwicli hyishras hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula lasiocarpa is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant

is self-fertile. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: StemEdible Uses: Stems[177]. No more details are given, but the flowers and leaves of this plant should also be edible[K].

tcanta None known dwatta None known propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°c. Easy[221]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. A rock garden plant, it is difficult to grow in the garden needing a very gritty soil and perfect drainage[1]. It grows freely amongst rocks or in a loose scree, but is very impatient of winter wet[221]. Plants are hardy to at least -15°c[200]. Slugs are very partial to this plant[221]. Members of this genus are rarely if ever troubled by browsing deer[233]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Plants produce seed freely in British gardens[221]. There is at least one named variety, selected for its ornamental value. 'Alba' has white flowers[200].

### 5.2.534 Oxalis corniculata

Yellow Sorrel, Creeping woodsorrel

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.1 m hkuc htut cyutli kyucucup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Oxalis corniculata is a ANNUAL/PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Gum-Leaves - raw or cooked[2, 46, 61, 105]. Added to salads, cooked as a potherb with other milder flavoured greens or used to give a sour flavour to other foods[183]. The leaves are available all year round unless the winter is very cold, they have a pleasantly sour taste[114], but are very small and fiddly to harvest[K]. The leaves contain about 86% water, 2.3% protein, 0.8% fat, 8.2% carbohydrate, 150mg calcium, 78mg phosphorus, 8mg iron, 0.6mg niacin, 78mg vitamin C, 6050µg beta carotene[173]. The leaves contain between 7 - 12% oxalate[218]. Use in moderation, see notes at top of sheet, Flowers - raw. A nice acid flavour and a pleasant addition to the salad bowl[K].

tcanta Dye Gum MiscellanyaA slimy substance collects in the mouth when the leaves are chewed, this is used by magicians to protect the mouth when they eat glass[114]. Yellow, orange and red to brown dyes are obtained from the flowers[168]. The boiled whole plant yields a yellow dye[257].

dwatta Anthelmintic Antiphlogistic Antiscorbutic Astringent Depurative Diuretic Emmenagogue Febrifuge Lithotropic Miscellany Stomachic Styptic Urinary Vitamin CThe whole plant is anthelmintic, antiphlogistic, astringent, depurative, diuretic, emmenagogue, febrifuge, lithotropic, stomachic and styptic[147, 178, 218, 240]. It is used in the treatment of influenza, fever, urinary tract infections, enteritis, diarrhoea, traumatic injuries, sprains and poisonous

regularly, however, due to its possible purgative effect[179]. Young shoots - cooked[46, 61, 105]. Some caution is advised since they are possibly purgative[179].

tcanta StringThe stems are very flexible and can be used as an emergency string for tying[6]. It is fairly strong but not very long-lasting[K].

dwatta Chologogue Demulcent Diuretic Febrifuge Poul-tice PurgativeThe root is demulcent, diuretic, febrifuge, poul-tice and strongly purgative[9, 21, 178, 222]. Use of the root is believed to increase the flow of bile[222].

propta Seed - sow spring in a cold frame in a free draining compost and only just cover. The seed usually germinates in 1 - 3 months at 15°c[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring whilst dormant[200].

nwatta Easily grown in ordinary garden soil in a sunny position, but plants are apt to become invasive[1, 200]. Hedge bindweed is a troublesome garden weed, especially when growing on moist soils[1, 4]. The plant is a vigorous climber with annual shoots 3 metres or more long. These twine around other plants and can kill them by smothering them[4]. Once established, it is very difficult to eradicate the plant because it has very deep roots and is capable of re-growing from any part of the root left in the ground. The flowers open in sunny weather and remain closed during dull weather[4]. Nearly all taxa in Calystegia intergrade geographically into neighboring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically[266].

### 5.2.447 Cornus quinquenervis

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cornus quinquenervis is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: A specimen of this species seen growing at Kew in September 1994 was carrying a few red fruits about 30mm long and 12mm wide - these were not fully ripe and were slightly astringent but they showed some potential[K]. There must be some doubt about the validity of the name of the Kew plant since the botanical description of the plant says that the fruits are black, globose and 6mm in diameter[266].

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full

sun or light shade[188]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.448 Aralia schmidtii

Sakhalin Spikenard

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc pcimhmm cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aralia schmidtii is a PERENNIAL growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves Root StemEdible Uses: The following uses are for the closely related *A. cordata*. It is quite possible that they also apply to this species[K]. Shoots - cooked or raw[2, 46, 61, 105, 177]. They can be up to 1.5 metres long and have a mild and agreeable flavour[116]. They are usually blanched and are crisp and tender with a unique lemon-like flavour[183]. They can be sliced and added to salads, soups etc[206]. The shoots contain about 1.1% protein, 0.42% fat, 0.8% soluble carbohydrate, 0.55% ash[179]. Root - cooked[22, 105, 177]. Used like scorzonera[2].

tcanta None known dwatta None known

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Prefers a deep moderately fertile moisture-retentive well-drained loam and a semi-shady position[1, 11, 200]. Requires a sheltered position[200]. Plants are hardier when grown in poorer soils[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°c[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species is closely related to *A. racemosa*[200]. The rootstock is similar to *A. cordata*[200]. It is considered to be no more than a subspecies of *A. cordata* by some botanists[275].

### 5.2.449 Aralia chinensis

Chinese Angelica Tree, Pumila Spirea, Chinese Astilbe

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 3.5 m hkuc pcimhmm cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aralia chinensis is a deciduous Shrub growing to 3.5 m (11ft 6in) at a medium rate. It is frost tender. It is in flower from August to September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[46, 61, 105, 177]. Used as a vegetable[206]. Blanched and used in salads[116]. Although no records of edibility have been seen for the seed, it is said to contain 5.8 - 17.5% protein, 4.2 - 46.3% fat and 3.7 - 5.7% ash[218].

tcanta None known dwatta Anodyne Carminative Diuretic SialagogueThe stem and root are anodyne and carminative[147, 218]. It

is used as a warming painkilling herb in the treatment of rheumatoid arthritis[238]. The root is also considered to be useful in the treatment of diabetes and dysmenorrhoea[218]. Some caution is advised since the bark is considered to be slightly poisonous[218]. The stembark is diuretic and sialagogue[218].

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Landscape Uses:Border, Container, Massing, Rock garden, Woodland garden. Prefers a good deep loam and a semi-shady position[1, 11, 200]. Requires a sheltered position[1]. Plants are hardier when grown in poorer soils[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species is closely allied to *A. elata*[11]. A very ornamental plant[1, 11]. Special Features:Attractive foliage, Suitable for dried flowers.

## 5.2.450 Rubus deliciosus

Rocky Mountain Raspberry. Delicious raspberry
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Rubus deliciosus is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. The fruit is not highly valued[183]. It is delicious[2]. Dry and of no flavour[1, 11]. The fruit is rather on the dry side and has lots of seeds to very little flesh, but the flavour is delicious[K]. The hemispherical fruit is about 15mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°c and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in a sunny position[184]. A very ornamental plant[1, 11], it is hardy to about -20°c[184]. The flowers have a delicious perfume[245]. This species is very closely related to *R. trilobus*[200]. The plant has perennial stems and should not be pruned like normal raspberries[200]. Instead it is sufficient to prune out any dead stems. There are no prickles on the stems[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.451 Ligustrum obtusifolium

Border privet

4 tin 7 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ligustrum obtusifolium is an evergreen Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: Coffee TeaThe roasted seed is a coffee substitute[61, 177]. Leaves are a tea substitute[177].

tcanta WaxA commercial insect wax is produced on the branches as a result of eggs being laid by insects[11]. Another report says that the wax is produced by the plant due to the stimulation of the feeding insects[61]. Yet another report says that the wax is produced by the insects[178]. It is used for candles and as a polish for earthenware pots, book edges etc[178]. The sub-species *L. obtusifolium* regelianum and its cultivar 'Dart's Perfection' make a good carpeting ground cover about 1.2 metres tall. They should be spaced about 2.5 metres apart each way[208].

dwatta None known

propta The seed does not require any pre-treatment and can be sown in the spring in a cold frame[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 10cm with a heel, July/August in a frame. Very easy[78]. Cuttings of mature wood, 20 - 30cm in a sheltered outdoor bed in November/December. High percentage[78].

nwatta Landscape Uses:Foundation, Hedge, Screen, Superior hedge. A very tolerant and easily grown plant, it succeeds in any soil that is not overwatered or water-logged[11, 182]. Grows well in heavy clay soils. A very ornamental plant[1]. Polymorphic[58]. Prefers hotter summers than are normally experienced in Britain[11]. Closely related to *L. ovalifolium*[200]. This species is notably susceptible to honey fungus[200]. Special Features:Not North American native, Invasive, Attractive flowers or blooms.

## 5.2.452 Berberis gagnepainii

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 2.4 m hkuc hmimhtut cyutli kyuctup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis gagnepainii is an evergreen Shrub growing to 2.4 m (7ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruits are about 10mm long[200].

tcanta Dye Hedge HedgeThe plant makes an impenetrable hedge that can be trimmed or left to its own devices[29, 182, 200]. A yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrhrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots

as a cure for fresh wounds[4]. An ointment made from the leaves is applied externally to wounds, bruises etc[4, 232] whilst a distilled water is used internally to treat inflammatory disorders of the liver[4]. Chewing the fresh leaves is said to be a cure for mouth ulcers[244]. Daisies also have a reputation for effectiveness in treating breast cancers[7]. The flowers and leaves are normally used fresh in decoctions, ointments and poultices[238]. A strong decoction of the roots has been recommended for the treatment of scorbutic complaints and eczema, though it needs to be taken for some time before its effect becomes obvious[244]. A mild decoction may ease complaints of the respiratory tract, rheumatic pains and painful or heavy menstruation[244]. The plant, harvested when in flower, is used as a homeopathic remedy[232]. Its use is especially indicated in the treatment of bruising etc[232].

propta Seed - sow as soon as the seed is ripe in June. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late summer[200]. Division after flowering[200]. Very easy, it can be done at almost any time of the year, though spring and early summer are best[K]. The divisions can be planted straight out into their permanent positions.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Rock garden. Succeeds in most well-drained soils in sun or semi-shade[188, 200]. The daisy is commonly found growing in many lawns, some varieties have been developed for the flower garden[1]. It is a good plant for the spring meadow[24]. The plants have a very long flowering season, they will even produce a few flowers in the middle of mild winters[K]. Special Features: Edible, Not North American native, Naturalizing, Attracts butterflies, Suitable for dried flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.529 Arabis alpina

Alpine Rock Cress, Alpine rockcress

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Arabis alpina is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to May, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young leaves - cooked or raw[105, 177]. An agreeable cross-like flavour[183]. Flowers - raw or cooked[105, 177]. A cross-like flavour[183].

tcanta None known

dwatta None known

propta Seed - it is best to surface sow the seed as soon as it is ripe in a light position in a cold frame[134]. Seed can also be sown in spring. It usually germinates in 2 - 3 weeks at 21°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering[111]. Very easy, the divisions can

be planted out straight into their permanent positions if required. Cuttings in a shady border in summer[1].

nwatta Easily grown in ordinary well-drained soil[1, 134]. Prefers a sandy loam and a sunny position. Another report says that it prefers partial shade[134]. Plants resent root disturbance and are best put in their final positions whilst still small[134]. The flowers are attractive to bees.

## 5.2.530 Polygonatum humile

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc pimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Polygonatum humile is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked. They can be used as an asparagus substitute. Root - cooked[105]. Rich in starch.

tcanta None known

dwatta Antiperiodic Antirheumatic Demulcent Refrigerant Sedative Sialagogue TonicThe roots are antiperiodic, antirheumatic, demulcent, refrigerant, sedative, sialagogue and tonic[218].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. This species is hardy to about -20°c[187]. Closely related to *P. hirtum*[200]. Closely allied to *P. odoratum*. Plants are often mistakenly grown as *P. palcatum*[187]. The rhizomes are slender and creeping, the plant forming spreading colonies[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Young shoots are very attractive to slugs. Hybridizes with other members of this genus[200].

## 5.2.531 Equisetum pratense

Meadow Horsetail

4 tin 8 cyuc 2 kcaak 2 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Equisetum pratense is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen in April. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Roots - raw or cooked[46, 61, 85, 161, 257]. Caution is advised, see the notes above on toxicity. A further report says that the peeled stems, base of the plant, root and tubers were eaten raw by the N. American Indians, the report went on to say that this may be inadvisable[85].

tcanta Dynamic accumulator.



ciently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Succeeds in any good soil[187]. Prefers a well-drained light rich or peaty soil[1, 200]. Requires a moist peaty soil and a sunny position[111, 134]. A good bee plant[50, 74]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. The small, pale-lilac flowers are sweetly scented[245]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134].

### 5.2.526 Blechnum spicant

Hard Fern, Deer fern

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Blechnum spicant is an evergreen Fern growing to 0.3 m (1ft) by 0.3 m (1ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen from June to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked. An emergency food, used when all else fails[177]. Young shoots (often called croziers) - cooked[177]. The young tender stems can be peeled and the centre portion eaten[257]. An emergency food, it is only used when all else fails[177, 213]. It is also chewed to alleviate thirst on long journeys[213].

tcanta A good ground cover plant[208]. Relatively slow growing but succeeding in the dense shade of trees[197, 200].

dwatta Astringent Cancer Skin StomachicThe leaflets have been chewed in the treatment of internal cancer, lung disorders and stomach problems[257]. The fronds are used externally as a medicine for skin sores[257]. A decoction of the root has been used in the treatment of diarrhoea[257].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Over-winter for the first year in a greenhouse and plant outside in late spring or early summer. Division in spring or autumn. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta A calcifuge plant[17], it prefers a moist shady nook in the rock garden or a position in open woodland in a moist soil[1]. Succeeds in quite dense tree shade if the soil is moist[200]. Prefers a moist position and a northerly aspect but succeeds in sun and in clay soils[1]. A polymorphic and very ornamental species[1], there are several named varieties[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.527 Erythronium helena

Mt. St. Helena Fawm Lily, Pacific fawnlily

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Erythronium helena is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: The following use has been noted for the closely related E. orionum and probably also applies to this species[K], which has corms 6 - 8cm long and up to 15mm thick[71]. Bulb - raw, cooked or dried for later use[183].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Plants prefer perfect drainage and require drier conditions when dormant[200]. Plants are hardy to at least -15°C[200]. Plants are growing well in the light shade of a woodland garden at Kew[K]. Bulbs should be planted about 7cm deep[1]. This species is closely related to E. californicum, E. orionum, E. citrinum and E. howellii[207].

### 5.2.528 Bellis perennis

Daisy, Lawndaisy, English Daisy

4 tlin 8 cyuc 2 kcaak 1 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxfre7t hjonli

drutta Bellis perennis is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower all year, and the seeds ripen from May to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[2, 7, 52, 115]. The flavour is somewhat acrid[4]. A pleasant sour flavour according to another report[238] whilst a third says that they are mild and agreeable and are used in salads[217]. The daisy is occasionally used as a potherb[183]. Flower buds and petals - raw[144, 183]. Eaten in sandwiches, soups and salads[183].

tcanta RepellentAn insect repellent spray can be made from an infusion of the leaves[57]. Daisies have traditionally been used for making daisy chains in children's games.

dwatta Anodyne Antidiarrhoeal Antispasmodic Antitusive Cancer Demulcent Digestive Eczema Emollient Expecto-rant Laxative Ophthalmic Purgative TonicDaisies are a popular domestic remedy with a wide range of applications[7]. They are a traditional wound herb[238] and are also said to be especially useful in treating delicate and listless children[7]. Recent research (1994) has been looking at the possibility of using the plant in HIV therapy[238]. The herb is mildly anodyne, antispasmodic, antitussive, demulcent, digestive, emollient, expectorant, laxative, ophthalmic, purgative and tonic[7, 9, 21]. The fresh or dried flowering heads are normally used[9]. An infusion is used in the treatment of catarrh, rheumatism, arthritis, liver and kidney disorders, as a blood purifier etc[9]. The daisy once had a great reputation

and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Suckers, removed in late autumn/early winter and planted out in situ or potted up and planted out in late spring[200].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. A number of cultivars have been selected for their ornamental value[200]. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they re-sprout well from the base[200].

### 5.2.453 Silphium laciniatum

Compass Plant, Robinson's compassplant

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Silphium laciniatum is a PERENNIAL growing to 2 m (6ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: GumA resin exudes naturally from the plant, and can also be obtained by incision[4]. It is an inexpensive substitute for mastic and is used as a chewing gum to sweeten the breath[4, 61, 105, 257]. It forms on the upper part of the flowering stem[183].

tcanta GumNone known

dwatta Diuretic Emetic Expectorant Tonic VermifugeThe resin obtained from the plant is diuretic[4, 61, 222]. It imparts a strong aromatic odour to urine[4]. A tea made from the roots is vermifuge and a tonic for general debility[4, 61, 222]. It is used as an expectorant in coughs and other pulmonary ailments[4]. A decoction of the smaller roots has been used as an emetic[257]. A tea made from the leaves is emetic, it has also been used in the treatment of coughs, lung ailments and asthma[222].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Division in spring[188]. This is very difficult due to the deep and extensive root system.

nwatta Industrial Crop: Hydrocarbon Management: Standard Wild CropSucceeds in any ordinary garden soil[1]. Prefers a deep moisture retentive moderately fertile soil that is not too nitrogen rich, in sun or dappled shade[200]. Prefers a shady position[200]. A very ornamental plant[1]. Leaves of young plants tip vertically and align themselves north to south to minimise exposure to the midday sun[200]. Plants have a deep and extensive root system which makes transplanting difficult[200]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

### 5.2.454 Aciphylla squarrosa

Speargrass

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 2.5 m hkuc htut cyutli kyuctup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Aciphylla squarrosa is an evergreen Perennial growing to 2.5 m (8ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Gum GumRoot - cooked. Aromatic[173]. A very good taste[177, 183]. The resin is used as a chewing gum[173]. Shoots and young stems[173]. No further details.

tcanta GumThe plant yields a semi-transparent resinous gum that is edible and also used in perfumery[128].

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe[200]. Stored seed should be sown in a greenhouse in late winter or early spring. Germination can be very slow. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter before planting them out in late spring or early summer, after the last expected frosts.

nwatta Requires a perfectly drained gritty soil in full sun[200]. Easily grown in a moist but well-drained soil in full sun[187]. Hardy to about -10°C according to one report[200] whilst another says it is hardy to about -15°C[187]. Dioecious but female plants have occasional male flowers[200]. Male and female plants must normally be grown if seed is required. The flowers are sweetly scented[187].

### 5.2.455 Rosa woodsii

Western Wild Rose, Woods' rose, Tehachapi rose

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rosa woodsii is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit StemEdible Uses: TeaFruit - raw or cooked[101, 155, 257]. They are used in making jams, jellies etc. The taste and texture are best after a frost[116]. The fruit can also be dried and used to make a pleasant tasting fruity-flavoured tea[183]. The fruit is up to 15mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. Young shoots - raw[172]. Harvested whilst still tender in the spring, they are best peeled[257]. Petals - raw. Remove the bitter white base[172]. The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102]. The bark, young shoots, leaves and fruit have all been used to make tea-like beverages[257].

tcanta None known

dwatta Analgesic Astringent Cancer Diuretic Foot care Poulitice Salve Stings Women's complaintsThe seeds have been used as a poultice to produce a drawing effect for treating muscular pains[257]. An infusion of the leaves has been used as a spring tonic[257]. A poultice of the chewed leaves has been used to allay the pain of bee stings[257]. The leaves have been placed in the shoes as a protection from athlete's foot[257]. The roots are blood tonic and diuretic[257]. A decoction of the roots has been used by adults and children in the treatment of diarrhoea and intestinal influenza[257]. A

decoction of the root or inner bark has been used in the treatment of colds[257]. An infusion of the fruits has been used in the treatment of coughs[257]. Various parts of the plant have been used to make poultices to apply to burns, sores, cuts, swellings and wounds[257]. A decoction of the branches, combined with chokecherry (*Prunus virginiana*) and red willow (*Salix bonplandiana*), has been used in the treatment of various women's complaints, diarrhoea and vomiting[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavonoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

**propta Seed.** Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbeded). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

**nwatta** Succeeds in most well-drained soils[11], preferring a circumneutral soil and a sunny position[200]. Grows well in heavy clay soils. Dislikes water-logged soils[200]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with box-wood[18]. Closely related to and hybridizes in the wild with *R. blanda*[11]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.456 *Helianthus laetiflorus*

Showy Sunflower, Cheerful sunflower  
4 tin 8 cyuc 2 ckaak 0 tcan 0 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

**drutta** *Helianthus laetiflorus* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**ckakta** Edible Parts: RootEdible Uses: Tubers - raw or cooked[55, 105, K]. Used like Jerusalem artichokes, to which they are not much inferior in taste though yields are lower[95, 183].

**tcanta** None known

**dwatta** None known

**propta** Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them in the greenhouse for their first winter. Plant them out into their permanent positions in

late spring or early summer, after the last expected frosts. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta** Succeeds in most soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A naturally occurring hybrid, *H. pauciflorus* (or *H. rigidus* in another report) x *H. tuberosus*[200]. Plants have a running root system and can be very invasive[1]. This species is often grown as an ornamental plant, there are several named varieties[1]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.457 *Oplopanax horridus*

Devil's Club

4 tin 8 cyuc 2 ckaak 0 tcan 2 dwat 2 m hkuc  
pcimhmin cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

**drutta** *Oplopanax horridus* is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil. The plant can tolerate maritime exposure.

**ckakta** Edible Parts: Leaves RootEdible Uses: Young shoots - peeled and then cooked[46, 61, 105, 106]. Only the very young shoots are used[172]. The roots can be chewed after peeling[105, 106, 161].

**tcanta** Parasiticide ParasiticideThe berries can be mashed into a pulp and then rubbed onto the scalp to get rid of head lice[257].

**dwatta** Analgesic Antidandruff Antiphlogistic Antirheumatic Hypoglycaemic Parasiticide Parasiticide TonicDevil's club was widely employed medicinally by several native North American Indian tribes who used it especially for its pain-relieving properties[257]. It is little, if at all, used in modern herbalism, though it probably merits further investigation. The root bark and stems are analgesic, antirheumatic, antiphlogistic, appetizer, blood purifier, cathartic, emmenagogue, galactagogue, hypoglycaemic, ophthalmic, pectoral and tonic[172, 157]. An infusion is used in the treatment of coughs and colds, bronchitis, tuberculosis, stomach problems etc[257]. A decoction is drunk in the treatment of rheumatism and is also applied externally as a wash on the affected joints[257]. A poultice of the bark has been used to relieve pain in various parts of the body[257]. A poultice of the bark has been applied to a nursing mother's breasts in order to stop an excessive flow of milk[257]. A decoction has been used as an eye wash in the treatment of cataracts and as a herbal steam bath for treating general body pains[257]. The burnt stems, mixed with oil, are applied as a salve on swellings[257]. An extract of the root bark lowers blood sugar levels and an infusion of the bark

female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**ckakta** Edible Parts: Edible Uses: Colouring Condiment TeaThis species has been used as a saffron substitute[200]. The following notes are for the genuine saffron, *C. sativus*:- The flower styles are used as a flavouring and yellow colouring for various foods such as bread, soups, sauces, rice and puddings[2, 4, 7, 14, 21, 27, 34, 183]. Extremely rich in riboflavin[137]. Water soluble[171]. Yields per plant are extremely low, about 4000 stigmas yield 25g of saffron[89]. Saffron is the world's most expensive spice, it takes 150,000 flowers and 400 hours work to produce 1 kilo of dried saffron[238]. About 25 kilos of styles can be harvested from a hectare of the plant[4]. The flower styles are used as a tea substitute[183].

**tcanta** DyeThe yellow dye obtained from the stigmas has been used for many centuries to colour cloth[4, 7, 14, 21]. It is the favoured colouring for the cloth of Indian swamis who have renounced the material world. A blue or green dye is obtained from the petals[168].

**dwatta** Anodyne Antispasmodic Aphrodisiac Appetizer Carminative Diaphoretic Emmenagogue Expectorant SedativeThis species has been used as a saffron substitute[200]. The following notes are for the genuine saffron, *C. sativus*:- Saffron is a famous medicinal herb with a long history of effective use[4, 7]. The flower styles and stigmas are the parts used, but since these are very small and fiddly to harvest they are very expensive and consequently often adulterated by lesser products[7]. They are anodyne, antispasmodic, aphrodisiac, appetizer, carminative, diaphoretic, emmenagogue, expectorant, sedative and stimulant[4, 7, 21, 174, 176, 218]. They are used as a diaphoretic for children and to treat chronic haemorrhages in the uterus of adults[4]. A dental analgesic is obtained from the stigmas[7]. The styles are harvested in the autumn when the plant is in flower and are dried for later use[4], they do not store well and should be used within 12 months[238]. This remedy should be used with caution[21], large doses can be narcotic[240] and quantities of 10g or more can cause an abortion[218].

**propta** Seed - best sown as soon as it is ripe in a light sandy soil in pots in a cold frame[1]. The seed can also be sown in a cold frame in early spring[1]. Sow thinly because the seed usually germinates freely[1], within 1 - 6 months at 18°C[164]. Unless the seed has been sown too thickly, do not transplant the seedlings in their first year of growth, but give them regular liquid feeds to make sure they do not become deficient. Divide the small bulbs once the plants have died down, planting 2 - 3 bulbs per 8cm pot. Grow them on for another 2 years in a greenhouse or frame and plant them out into their permanent positions when dormant in late summer[K]. Plants take 3 - 4 years to flower from seed[200]. Division of the clumps after the leaves die down in spring[1, 200]. The bulbs can be replanted direct into their permanent positions if required.

**nwatta** Prefers a well-drained sandy or loamy soil that is free from clay[137]. Prefers some shade from the hottest sun in summer and at least a modicum of moisture during its summer dormancy[200]. Succeeds in grass, so long as this is not mown until the leaves die down, it also grows well under deep-rooting deciduous trees and shrubs[200]. It can also be grown with very low shallow-rooting groundcover plants such as lawn camomile (*Chamaemelum nobile* 'Treneague')[200]. Plants are very frost hardy[137]. Plants tend to move considerably from their original planting place because of their means of vegetative reproduction, it is therefore wise not to grow different species in close proximity[1]. The corms should be planted about 5 - 8cm deep in the soil[200]. Any planting out is best done in late spring or early summer[245]. Plants take 4 - 5 years to come into flowering from seed. The flowers are only open during the day time, closing at night[245].

## 5.2.525 *Asclepias quadrifolia*

Fourleaf Milkweed

4 tin 8 cyuc 2 ckaak 0 tcan 2 dwat 0.5 m hkuc

hmihtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

**drutta** *Asclepias quadrifolia* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**ckakta** Edible Parts: Flowers Leaves Oil Seed See Uses: Gum Oil Oil SweetenerThe following reports refer to other members of this genus and are possibly also appropriate to this species[K]. Unopened flower buds - cooked. They taste somewhat like peas. They are used like broccoli[183]. Flowers and young flower buds - cooked. Used as a flavouring and a thickener in soups etc[55, 102]. The flower clusters can be boiled down to make a sugary syrup[2, 85]. The flowers are harvested in the early morning with the dew still on them[95]. When boiled up it makes a brown sugar[95]. Young shoots - cooked. An asparagus substitute[2, 4, 43, 55, 62, 95, 183]. They should be used when less than 20cm tall[159]. A slightly bitter taste[159]. Tips of older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long, cooked[2, 43, 55, 85]. They are very appetizing. Best used when about 2 - 4cm long and before the seed floss forms, on older pods remove any seed floss before cooking them[85, 159]. If picked at the right time, the pods resemble okra[183]. The sprouted seeds can be eaten[183]. An edible oil is obtained from the seed[55, 171]. The latex in the stems is made into a chewing gum[46, 61]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112].

**tcanta** Fibre Gum Latex Oil Oil Pollution Stuffing Wick-The following reports refer to other members of this genus and are possibly also appropriate for this species[K]. A good quality fibre is obtained from the bark, used in making twine, cloth, paper etc[95, 112, 169]. It is of poor quality in wet seasons[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[112, 159, 169, 171]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[112]. Very water repellent, it can yield up to 550 kilos per hectare[112]. The floss has also been used to mop up oil spills at sea. Candlewicks can be made from the seed floss[112, 207]. Rubber can be made from latex contained in the leaves and the stems[46, 57, 102, 159]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112]. Pods contain an oil and a wax which are of potential importance. The seed contains up to 20% of an edible semi-drying oil[74, 112]. It is also used in making liquid soap[74].

**dwatta** Diuretic Laxative VD WartsA tea made from the roots is diuretic and laxative[222, 257]. It has also been used in the treatment of venereal diseases[257]. The leaves have been rubbed on warts in order to remove them[222]. The latex from the leaves is used, it needs to be applied daily for some time in order to be effective[K].

**propta** Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow suffi-

be sown in an outdoor seed bed during July, transplanting the plants to their final positions during early autumn[245]. These plants will grow larger and flower earlier than those sown in spring.

nwatta Succeeds in most soils, preferring a sunny position[1]. Prefers a fertile well-drained soil[111]. The flowers are a rich source of nectar and are very attractive to bees[1]. The dry leaves emit a rich musky fragrance, rather like wild strawberry leaves drying.

### 5.2.521 *Lewisia columbiana*

Columbian Bitterroot, Columbian lewisia, Wallowa lewisia 4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lewisia columbiana is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[257]. Said to be extremely nutritious. It is easiest to use when the plant is in flower because the outer layer of the root (which is very bitter) slips off easily at this time of the year. The root has a good taste though a decided bitter flavour develops afterwards[105, 161].

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame in a very freely draining soil[129]. Sow stored seed as soon as possible in a cold frame. One months cold stratification should improve germination, though this is still likely to be very slow. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first two winters. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March/April. Very difficult.

nwatta Requires a very well-drained gritty humus-rich deep soil in a sunny position[1, 200]. Prefers a neutral to acid soil and a position in semi-shade[188]. Best if given a north or north-east aspect in order to protect it from the midday sun[200]. Thrives on almost bare rock[1]. It might be worthwhile trying this species in a crevice of a sunny drystone wall[219]. This species prefers a moister soil than most members of the genus[188]. This species is not reliably hardy in Britain. It can withstand consistently very cold weather but does not like alternating periods of mild and cold conditions, nor does it like winter wet[1]. The plant is very susceptible to rotting at the neck in a damp soil[200]. A very ornamental plant[1], it is very apt to hybridize with other members of the genus[1].

### 5.2.522 *Anemone* *thalictroides*

Rue-Anemone

4 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat 0.1 m hkuc pcmhmim cyutli tcup hwicli hras hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Anemone

*thalictroides* is a PERENNIAL growing to 0.1 m (0ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in April. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[46, 61, 222]. Starchy[105, 177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta AstringentA tea made from the roots is used in the treatment of diarrhoea and vomiting[222]. A prepara-

tion of the root has historically been used in the treatment of piles[222].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in the spring. Division - this is best done in the autumn by carefully removing pieces from the outside of the clump and growing them on in pots until they are established[1, 200]. Be careful to disturb the main clump as little as possible[1].

nwatta Landscape Uses:Massing, Rock garden, Woodland garden. Requires a moist shady light soil[1], it strongly resents any wetness at the roots[200]. A delicate plant for a loose leafy soil in sun or part shade[187]. Plants dislike any root disturbance, they should be planted in their final positions whilst still young[1]. A greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Plants are slow to establish, often falling victim to slug predations[200]. Special Features:Attractive foliage, North American native.

### 5.2.523 *Polygonatum falcatum*

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc pcmhmim cyutli hgatyuctcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyfjxre7t hjonli

drutta Polygonatum falcatum is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[105]. They can be used as an asparagus substitute. Root - cooked[105]. Rich in starch.

tcanta Miscellany

dwatta Miscellany TonicEnergizer, tonic. Used to remove freckles[174].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. Thrives in dry shade as long as the soil is rich in humus, the plant is also fairly drought tolerant[190]. Requires a mulch protection for the roots in areas where winter temperatures go below -10°c[200]. The rhizomes are shortly-creeping, the plant forming clumps[187]. This species is often grown mistakenly as *P. pumilum*[200]. *P. humile* is often mistakenly grown as this species[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Young shoots are very attractive to slugs[K]. Hybridizes with other members of this genus[200].

### 5.2.524 *Crocus nudiflorus*

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Crocus nudiflorus* is a CORM growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from September to October. The species is hermaphrodite (has both male and

has been used in the treatment of diabetes[213]. The infusion also has a tonic effect on the blood and liver[213]. The inner bark is emetic in large doses and purgative (especially if taken with hot water)[257]. It is used in the treatment of coughs and colds, stomach and bowel cramps[257]. A poultice of the inner bark is used in the treatment of wounds, sores etc[257]. The berries have been rubbed on the scalp to combat lice and dandruff, and to make the hair shiny[256].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers in the dormant season. Root cuttings in a greenhouse in the winter[188].

nwatta Requires a cool moist soil[11, 200]. Prefers a position in light shade[182]. Prefers dense shade and is probably best if grown in moist woodland[1, 11]. Tolerates maritime exposure[200]. (Rather a strange report for a plant that needs to be grown in dense shade[K]). A very hardy plant, tolerating temperatures down to at least -15°c, but the young shoots in spring can be damaged by late frosts[11, 200]. It is therefore best not grown in a frost pocket[182]. This species was until recently considered to have its range in N. America and Japan, but the Japanese form has now been separated off into its own species as *O. japonicus*[200]. A very ornamental plant, but it is densely armed with spikes[60]. It transplants easily and also tolerates pruning[200]. The leaves and stems are excessively spiny[182].

### 5.2.458 *Helianthus strumosus*

Paleleaf Woodland Sunflower

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Helianthus strumosus* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[177]. No more details but it is probably used raw or cooked like the Jerusalem artichoke.

tcanta None known

dwatta Anthelmintic PectoralA decoction of the roots has been used to get rid of worms in both adults and children[257]. An infusion of the roots has been used in the treatment of lung problems[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. Prefers a moist soil[200]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants have a running root system and can be invasive[1].

### 5.2.459 *Polygonatum commutatum*

King Solomon’s Seal, Smooth Solomon’s seal

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyfjxre7t hjonli

drutta *Polygonatum commutatum* is a PERENNIAL growing to 2 m (6ft) by 0.6 m (2ft in). See above for USDA

hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked. They can be used as an asparagus substitute. Root - cooked[22, 161]. A parsnip-like flavour[212]. Rich in starch, it can be dried and ground into a powder then used as a thickener in soups etc or can be added to flour when making cakes, bread or whatever[46, 61]. The root should be boiled and sun-dried nine times, it is then delicious[179] (if there is anything left!:[K])

tcanta IncenseThe root has been burnt in the house for its pleasant fragrance[257].

dwatta AnalgesicA decoction of the root has been used as a herbal steam inhalant as a treatment for headaches[257].

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. Grows well in woodlands and copses[1, 42]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots are very attractive to slugs[K]. Hybridizes with other members of this genus[200]. According to one report this species is no more than a synonym for *P. biflorum*[200].

### 5.2.460 *Berberis thunbergii*

Japanese Barberry

4 tlin 8 cyuc 2 kcaak 2 tcan 2 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyfjxre7t hjonli

drutta *Berberis thunbergii* is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105, 177]. Dry with a very poor flavour[K]. The fruits are about 8mm long[200]. Leaves - cooked.

tcanta Dye Hedge HedgePlants can be grown as a medium-size hedge[29]. They are very tolerant of trimming and have prickles which make them an effective barrier to larger creatures[K]. The cultivar ‘Atropurpurea Nana’ can be used for ground cover[208]. It makes a dense covering when planted 30cm apart each way[208]. A yellow dye is obtained from the root and branches[178]. An Ornamental plant.

dwatta Anthelmintic Antibacterial Antiseptic Cancer Dysentery FebrifugeThe root bark is anthelmintic, antiseptic and febrifuge[178]. Berberine, universally present in rhizomes of *Berberis* species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (Licorice) because this nullifies the ef-

fects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Fairly easy[11]. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Fairly easy[11]

nwatta Landscape Uses:Border, Erosion control, Foundation, Pest tolerant, Hedge, Massing, Rock garden, Standard, Superior hedge, Specimen, Woodland garden. Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Prefers a lime-free soil according to one report[182]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. Plants are hardy to about -25°C[184]. A commonly grown ornamental plant, there are many named varieties[182]. Plants can be pruned back quite severely, they resprout well from the base[200]. Unlike most other members of this genus, this plant does not usually hybridize with other species[67]. An alternate host of 'black-stem rust' of wheat so it has been extensively grubbed up from its habitats. This species is notably resistant to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Invasive, Inconspicuous flowers or blooms.

## 5.2.461 Ribes inebrians

Whisky Currant

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc  
hmmihmtu cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ribes inebrians is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaak Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105, 161, 257]. The fruit can also be dried for later use or made into preserves[105, 257]. One report says that although the fruit was eaten by the Hopi Indians, it could make you ill[216]. Another report says that the fruit was highly relished[257]. The fruit is about 5mm in diameter[200]. Leaves - cooked[105, 161].

tcanta None known

dwatta PoulticeA poultice of the plant has been applied to sores[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter; planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°C[200]. This species is closely related to *R. cereum*[11, 200]. Plants can harbour a stage of 'white pine blister rust', so they should

not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.462 Prunus pedunculata

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc  
hmmihmtu cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Prunus pedunculata is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaak Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[177]. The fruit is about 10mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta DyeA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Industrial Crop: Oil Management: Standard Wild CropThrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.463 Amelanchier parviflora

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Amelanchier parviflora is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckaak Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked. The fruit is rich in iron and copper[226].

tcanta Wood - fine grained, hard, very heavy, reddish. Used for small articles[74].

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking

"heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.518 Petasites hyperboreus

Arctic Sweet Coltsfoot

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.2 m hkuc  
pcimhmmihmtu cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Petasites hyperboreus is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kckaak Edible Parts: Flowers Leaves StemEdible Uses: SaltYoung leaves - cooked. A felt-like texture[172]. Young stalks and flower heads - cooked[172]. The burnt leaves are used as a salt substitute[172, 177]. The stems and leaves, whilst still green, are rolled up into balls, dried and then placed on top of a very small fire on a rock and burned[207]. A very acceptable condiment for piñole[207].

tcanta Containers StuffingThe cotton-like seed heads have been used as a stuffing material in mattresses etc[257]. The leaves have been used to make temporary cone-shaped containers for picking fruit[257]. The leaves have occasionally been used to form makeshift funnels[257].

dwatta Antispasmodic Pectoral Poultice SalveAntispasmodic, poultice, salve[172]. An infusion of the dried, stored leaves has been used in the treatment of colds, head and chest congestion[257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta We have very little information on this species and do not know if it will succeed in Britain, though judging by its native range it should succeed outdoors in most parts of the country. According to one report this species is no more than a synonym of *P. frigidus*[60]. The following notes are based on the general needs of the genus. Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Prefers partial shade[31]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Dioecious, male and female plants must be grown if seed is required.

## 5.2.519 Tradescantia virginiana

Spiderwort, Virginia spiderwort

4 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc  
hmmihmtu cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli dyatxre7t hjonli

drutta Tradescantia virginiana is a PERENNIAL growing to 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckaak Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[61, 103, 105, 213, 257]. The very young shoots and leaves can be chopped and added to salads or cooked as a potherb[183]. Flowers - raw. They make an attractive edible garnish[183].

tcanta None known

dwatta Kidney Laxative Poultice Women's complaints-The roots are laxative[222]. They are also used as a tea in the treatment of kidney and stomach ailments and women's complaints[222, 257]. A poultice of the leaves is applied to stings, insect bites and cancers[222, 257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[111]. Cuttings of young shoots, July in a frame. They root easily and quickly.

nwatta Landscape Uses:Border, Container, Ground cover, Woodland garden. An easily grown plant[233], it thrives in any good rather moist soil[1, 111]. Succeeds in dry soils[188]. Succeeds in dappled woodland shade[88, 111] or in full sun[111]. Hybridizes freely with other members of this genus[1]. Plants often self-sow in British gardens[1]. A very variable species, there are a number of named forms selected for their ornamental value[1]. Plants in this genus seem to be immune to the predations of rabbits[233]. Plants are self-sterile, at least two genetically distinct plants (and not divisions from the same plant) must be grown if seed is required. Special Features: Attractive foliage, North American native, Naturalizing, Wetlands plant, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

## 5.2.520 Anchusa officinalis

Alkanet, Common bugloss

4 tlin 8 cyuc 2 kcaak 1 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Anchusa officinalis is a BIENNIAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckaak Edible Parts: Flowers LeavesEdible Uses: ColouringLeaves and young shoots - cooked[9, 115, 166]. Used like spinach[2, 183]. Flowers - cooked or used as a garnish[183]. The red dye obtained from the roots can be used to colour oils and fats[105].

tcanta DyeA red dye is obtained from the roots[13].

dwatta Demulcent Expectorant HomeopathyAll parts of the plant are demulcent and expectorant[9]. They are used externally to treat cuts, bruises and phlebitis and internally to treat coughs and bronchial catarrh[9]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of stomach and duodenal ulcers[9].

propta Seed - sow spring in pots of sandy soil[200]. An overnight drop in temperature helps germination[133]. The seed usually germinates in 1 - 4 weeks at 21°C[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also

both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

**kcakta Edible Parts:** Flowers**Edible Uses:** Flowers - raw[105, 177]. They make a very attractive addition to salads[183].

**tcanta Plants** can be grown as a ground cover, they are best spaced about 35cm apart each way[208].

**dwatta None known**

**propta Seed** - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Root cuttings[200].

**nwatta** Easily grown in any moist soil in sun or part shade[187, 200]. Prefers a damp position[133, 200]. Grows well in heavy clay soils[208]. Dislikes very light or dry soils[1]. Grows well in the shade of a north-facing wall[208]. Plants are hardy to about -25°C[187]. A very ornamental plant, there are many named varieties[187]. It can be grown in a wild garden, rock garden or the flower border[1].

## 5.2.516 Lilium formosanum pricei

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

**drutta** Lilium formosanum pricei is a BULB growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Root**Edible Uses:** Bulb - cooked[105, 177]. The bulb is 2 - 4cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanum tuberosum).

**tcanta None known**

**dwatta None known**

**propta Seed** - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. This species can flower within a year from seed, especially if sown in the early autumn[143]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

**nwatta** Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. This sub-species tolerates temperatures down to about -10°C and can succeed outdoors in many parts of the country if care is given in its siting[260]. It can flower in the first year from seed[143, 260]. In a warm climate the plant grows continually and will grow happily in pots in a conservatory[260]. The bulbs can be crammed into the pot with crocks below to give good drainage and a good loose compost above[260]. The flowers diffuse a delicious sweet perfume[245]. Stem rooting, the bulbs should be planted 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.517 Chimaphila umbellata

Pipsissewa

4 tin 8 cyuc 2 kcaak 2 tcan 3 dwat 0.4 m hkuc pcmhnm cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

**drutta** Chimaphila umbellata is an evergreen Shrub growing to 0.4 m (1ft 4in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** Condi- ment TeaThe leaves are nibbled[177], brewed into a tea or used as a flavouring in root beer[183]. They have a delicious scent and flavour. An extract of the leaves is used to flavour candy and soft drinks[177, 183]. In Mexico the herb is used in the preparation of 'navaitai', an alcoholic beverage produced from sprouted maize[183]. A tea can be made from an infusion of the stems and roots[161, 177, 212].

**tcanta** Disinfectant EssentialThe plant's stoloniferous root system, and dwarf spreading habit make it a god ground cover, though it is a difficult plant to establish and grow well[245]. The plant is used in perfumery because of its delicate scent[9].

**dwatta** Alternative Antibacterial Astringent Disinfectant Diuretic Rubefacient Stimulant Tonic UrinaryPipsissewa was much used by many tribes of native North American Indians to induce sweating and treat fevers, including typhus[254, 257]. The plant contains hydroquinones which have a pronounced disinfectant effect within the urinary tract and modern day herbalism mainly employs the plant to treat urinary problems such as cystitis and urethritis[254]. The whole plant is alterative, antibacterial, astringent, diaphoretic, diuretic, rubefacient, stimulant and tonic[4, 9, 14, 21, 46, 165, 213, 207, 222]. An infusion is used in the treatment of various problems related to the urinary system, it is also prescribed for more serious conditions such as kidney stones and gonorrhoea[254]. A decoction is very efficacious in the treatment of skin diseases[4]. Used externally, the fresh leaves are rubefacient and internally they are of great use in cardiac and kidney diseases, chronic rheumatism and scrofula[4, 238]. Only the leaves are official, though the whole plant is often used[4]. The plant is loaded with the biologically active compounds arbutin, sitosterol and ursolic acid[222]. Arbutin hydrolyzes to the toxic urinary antiseptic hydroquinone[222]. The plant contains glycosides and an essential oil that are used as an astringent and tonic[212]. The plant is harvested when in flower, and the leaves on their own can be harvested during the growing season. They are dried for later use[238]. A homeopathic remedy is made from the leaves[9]. It is used in the treatment of inflammations of the urinary system[9].

**propta Seed** - this is very difficult to germinate, see the notes above in cultivation details. It is best sown in a shady area of the greenhouse on moist sphagnum peat as soon as it is ripe. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Rather difficult because the plant is very sensitive to root disturbance. It is best attempted in the spring as the plant comes into growth[200]. Cuttings of softwood, June in a frame. Use some soil from around an established plant[14].

**nwatta** Requires a light moist but well-drained lime-free soil and shade from direct sunlight[1]. This species is difficult to propagate and grow in cultivation, mainly because it has certain mycorrhizal associations in the wild and these are necessary if the plant is to thrive[200]. It is best to use some soil collected from around an established plant when sowing seed or planting out into a new position[200]. The plant has wide-spreading fibrous feeding roots and will often die or fail to increase in size if these are disturbed. The flowers have a sweet but refreshing perfume[245]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of

18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

**nwatta** Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Fairly lime tolerant[200]. Plants are hardy to about -20°C[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. A group of young plants about 5 years old growing at Kew under this name were about 2 metres tall with almost no side-branches in 1995 and flowering at the end of April. They look as though their final height will be substantially more than that given above[K]. This species is closely related to *A. ovalis*[11]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 5.2.464 Lonicera involucrata

Twinberry, Twinberry honeysuckle

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

**drutta** Lonicera involucrata is a deciduous Shrub growing to 1.2 m (4ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or dried[2, 46, 65, 155]. A pleasant taste[161]. Not tasty enough to be widely sought[212]. The only form we have tried has an incredibly bitter taste[K]. The fruit is about 8mm in diameter[200].

**tcanta** Disinfectant Dye HairA purple dye is obtained from the fruit[99, 257]. It is grey when tin is used as a mordant[168]. The berries are rubbed onto the scalp as a hair tonic. It is said to prevent greyness[99]. (don't mix the berries with tin though!![K])

**dwatta** Antidandruff Antipruritic Disinfectant Emetic Galactagogue Laxative Ophthalmic Pectoral PoulitceTwinberry was employed medicinally by a number of native North American Indian tribes who used it to treat a range of complaints[257]. It is little, if at all, used in modern herbalism. The bark is disinfectant, galactagogue, ophthalmic and pectoral[257]. A decoction is used in the treatment of coughs and as an eyewash[257]. A decoction of the bark has been applied to a woman's breasts to encourage milk flow[257]. The bark has also been used as a dressing on burns[257]. The leaves are antipruritic and ophthalmic[257]. A poultice of the chewed leaves is applied to venereal sores, itchy skin and boils[128, 257]. A decoction of the leaves is used as an eye wash[257]. The fruits are antidandruff, emetic, laxative and pectoral[218, 257]. An infusion is used to treat chest and stomach complaints and to cleanse the body[257]. The mashed fruit has been rubbed into the scalp as a treatment for dandruff.

**propta Seed** - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the

greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

**nwatta** An easily grown and very tolerant plant, succeeding in any fertile soil, and preferring a good moist soil in a sunny position[11, 200]. It produces less fruit when grown in the shade[200]. Plants have proved to be quite wind resistant when growing on an exposed site in Cornwall[K]. Plants are hardy to about -25°C[184]. Closely allied to *L. ledebourii*[11]. There are some named forms, developed for the ornamental garden[182]. 'Humilis' is a smaller form and 'Serotina' is later flowering[182].

## 5.2.465 Dryopteris dilatata

Shield Fern

4 tin 8 cyuc 2 kcaak 0 tcan 4 dwat 1.2 m hkuc hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

**drutta** Dryopteris dilatata is a FERN growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen from July to September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

**kcakta Edible Parts:** Leaves Root**Edible Uses:** Young fronds - they must be cooked[172. Some caution is advised, see the notes above on toxicity. Root - cooked[118, 161, 177]. Harvested in the spring and baked[213].

**tcanta** Hair PackingAn infusion of the fronds is used as a hair rinse and to treat dandruff[172, 213]. The leaves can be used as a packing material for fruit etc[172]. Plants can be grown as a ground cover when spaced about 60cm apart each way[208].

**dwatta** Antidandruff VermifugeThe root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent[4, 172, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. The root is also used in the treatment of dandruff[4, 172].

**propta** Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** An easily grown plant[233], it prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Prefers a moist soil[188], but is drought tolerant when well established[200]. Plants are evergreen in mild winters[188]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.466 Juniperus horizontalis

Creeping Juniper, Horizontal Juniper

4 tin 9 cyuc 2 kcaak 3 tcan 1 dwat 1 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wissliphson hpa7tmwatli nyanhjen hjonli

**drutta** Juniperus horizontalis is an evergreen Shrub growing to 1 m (3ft 3in) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in

leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Edible Uses: Coffee TeaThe fruits are roasted and used in the preparation of a coffee-like beverage[183]. A tea is made from the young branch tips[183, 257].

**tcanta Baby care IncenseLandscape Uses:** Cascades, Erosion control, Ground cover, Massing, Rock garden, Seashore. A good ground cover plant for a sunny position[208], eventually making a dense cover though it requires weeding for the first year or so[197]. The bark has been crushed and used as a soft hygienic pad in cradles[257]. It has also been used to make mats[257]. The young twigs and leaves have been burnt as an incense[257].

**dwatta Diaphoretic Febrifuge Kidney**An infusion of the branches, or fleshy cones, has been used in the treatment of coughs, colds and fevers[257]. The cones or branches can also be used as a steam bath[257]. An infusion of the seeds has been used in the treatment of kidney problems[257].

**propta** The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

**nwatta** Succeeds in a sunny position in most soils so long as they are well drained, preferring a neutral or slightly alkaline soil[11] and succeeding on chalk[200]. Succeeds in dry soils[200]. An aggregate species[204]. There are many named varieties selected for their ornamental value[200]. 'Bar Harbour' is very salt-resistant[200]. Dioecious, male and female plants must be grown if seed is required. Special Features: North American native, Fragrant foliage, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 5.2.467 *Pycnanthemum pilosum*

Mountain Mint, Whorled mountainmint

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Pycnanthemum pilosum* is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** LeavesEdible Uses: Condiment TeaFlower buds and leaves - raw or cooked[**K**]. A nice addition to salads or used as a condiment. The fresh or dried leaves are brewed into a delicious mint-like tea[183].

**tcanta** None known

**dwatta** None known

**propta** Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If there are sufficient seeds they can be sown in an outdoor seedbed in April. Division in spring.

**nwatta** Succeeds in most soils[1] but prefers a rich loamy soil in full sun or partial shade with plenty of moisture in the growing season[200]. A good butterfly plant[**K**].

## 5.2.468 *Prinsepia sinensis*

Cherry prinsepia

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Prinsepia sinensis* is a deciduous Shrub growing to 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** FruitEdible Uses: Fruit - raw or cooked[1, 105, 177]. Red and juicy[11]. A pleasant sour taste[74], they can be eaten out of hand or made into jellies[183]. The plum-shaped fruit is about 15mm long with one large seed[200].

**tcanta** None known

**dwatta** None known

**propta** Seed - best if given 2 months cold stratification[113]. Sow the seed in autumn if possible, otherwise in late winter or early spring in a cold frame in light shade. Germination may be inhibited by light[113]. Prick out the seedlings when they are large enough to handle into individual pots. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113].

**nwatta** Succeeds in any moderately fertile well-drained soil in full sun or light shade[182, 200]. The plants produce flowers and fruits better when they are growing in full sun[200]. Flowers are produced on the previous seasons wood[200]. They are produced on old wood according to another report[182]. This plant has a potential for commercial fruit production[74]. Unfortunately, it only fruits in Britain after long hot summers[200].

## 5.2.469 *Calligonum aphyllum*

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc htut cyutli hgatkuyctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Calligonum aphyllum* is an evergreen Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Fruit LeavesEdible Uses: GumYoung shoots - cooked[105]. An edible gum or mucilage is obtained from the leaves[105]. The pounded root furnishes an edible mucilaginous substance resembling gum tragacanth (see *Ferula* species)[2, 177]. One report says that the plant has an edible fruit[105]. This possibly refers to the seed.

**tcanta** GumNone known

**dwatta** None known

**propta** Seed - we have no information on this species. The seed is probably best sown in late winter in a greenhouse. Prick out the seedlings when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in early summer of the following year.

handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

**nwatta** Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. All members of this genus have more or less edible leaves and flower buds, though those species, such as this one, with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159].

## 5.2.513 *Polygonum aviculare*

Knotweed, Prostrate knotweed

4 tin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli fyifxre7t hjonli

**drutta** *Polygonum aviculare* is an ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Leaves SeedEdible Uses: TeaYoung leaves and plants - raw or cooked[105, 177]. Used as a potherb[183], they are very rich in zinc[179]. A nutritional analysis is available[218]. Seed - raw or cooked. Rather small and fiddly to utilize, they can be used in all the ways that buckwheat (*Fagopyrum esculentum*) is used, either whole or dried and ground into a powder for use in pancakes, biscuits and piñole[4, 55, 106, 161, 183]. The leaves are a tea substitute[183].

**tcanta** DyeYields a blue dye that is not much inferior to indigo[115]. The part used is not specified, but it is likely to be the leaves. Yellow and green dyes are obtained from the whole plant[168]. The roots contain tannins, but the quantity was not given[223].

**dwatta** Anthelmintic Antiphlogistic Astringent Cardiotonic Cholagogue Diuretic Dysentery Emetic Emollient Expectorant Febrifuge Haemostatic Lithontritic Purgative TB Vasoconstrictor VulneraryKnotweed is a safe and effective astringent and diuretic herb that is used mainly in the treatment of complaints such as dysentery and haemorrhoids. It is also taken in the treatment of pulmonary complaints because the silicic acid it contains strengthens connective tissue in the lungs[254]. The whole plant is anthelmintic, astringent, cardiotonic, cholagogue, diuretic, febrifuge, haemostatic, lithontritic and vulnerary[4, 7, 9, 21, 53, 147, 172, 176, 178]. It was formerly widely used as an astringent both internally and externally in the treatment of wounds, bleeding, piles and diarrhoea[4]. Its diuretic properties make it useful in removing stones[4]. An alcohol-based preparation has been used with success to treat varicose veins of recent origin[7]. The plant is harvested in the summer and early autumn and is dried for later use[9]. The leaves are anthelmintic, diuretic and emollient[218]. The whole plant is anthelmintic, antiphlogistic and diuretic[218]. The juice of the plant is weakly diuretic, expectorant and vasoconstrictor[218]. Applied externally, it is an excellent remedy to stay bleeding of the nose and to treat sores[4]. The seeds are emetic and purgative[4, 240]. Recent research has shown that the plant is a useful medicine for bacterial dysentery. Of 108 people with this disease, 104 recovered within 5 days when treated internally with a paste of knotweed[254].

**propta** Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted

out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment, in good soils the plant will cover an area up to a metre in diameter[1, 4]. Prefers an acid soil[20]. Dislikes shade. Knotweed is a common and invasive weed of cultivated ground[7]. It is an important food plant for the caterpillars of many species of butterflies[30]. It also produces an abundance of seeds and these are a favourite food for many species of birds[4]. Plants seem to be immune to the predations of rabbits[233]. The flowers have little or no scent or honey and are rarely visited by pollinating insects. Self-fertilization is the usual method of reproduction, though cross-fertilization by insects does sometimes occur[4]. The plant also produces cleistogamous flowers - these never open and therefore are always self-fertilized[4]. The plant is very variable and is seen by most botanists as an aggregate species of 4 very variable species, viz. - *P. aviculare*. L.; *P. boreale*. (Lange.)Small.; *P. rivivacuum*. Jord. ex Box.; and *P. arenastrum*. Box[17].

## 5.2.514 *Ambrosia artemesiifolia*

Roman Wormwood, Bitterweed, Blackweed, Carrot Weed, Hay Fever Weed, Stickweed, Tassel Weed, Wild Ta 4 tin 8 cyuc 2 kcaak 1 tcan 3 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

**drutta** *Ambrosia artemesiifolia* is an ANNUAL growing to 0.9 m (3ft) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** OilEdible Uses: OilAn oil is obtained from the seed. It has been suggested for edible purposes because it contains little linolenic acid[61, 183]. The seed contains up to 19% oil[61], it has slightly better drying properties than soya bean oil[183].

**tcanta** Disinfectant OilThere is some indication it has been used as a disinfectant and Oil.

**dwatta** Antidote Astringent Disinfectant Emetic Febrifuge Women's complaintsThe leaves are very astringent, emetic and febrifuge[222, 257]. They are applied externally to insect bites, rheumatic joints and various skin complaints, internally they are used as a tea in the treatment of fevers, pneumonia, nausea, intestinal cramps, diarrhoea and mucous discharges[222, 257]. Juice from the wilted leaves is disinfectant and is applied to infected toes[257]. A tea made from the roots is used in the treatment of menstrual disorders and stroke[222]. The pollen is harvested commercially and manufactured into pharmaceutical preparations for the treatment of allergies to the plant[222].

**propta** Seed - we have no details for this species but suggest sowing the seed in situ in April.

**nwatta** We have very little information on this species but suggest growing it in a sunny position in a well-drained soil. It has been suggested for commercial cultivation[61]. Some plants produce mainly sterile heads[60]. The pollen from the flowers of this species is an important cause of hay-fever in N. America[17]. Special Features:North American native, Invasive, Inconspicuous flowers or blooms.

## 5.2.515 *Primula denticulata*

Drumstick Primula

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** *Primula denticulata* is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has



symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Bulbs can also be transplanted with a large ball of soil around the roots when they are in leaf, they are impatient of root disturbance[1]. Plants seem to be immune to the predations of rabbits[233]. Cultivated plants are very susceptible to the predation of slugs and snails[230].

### 5.2.509 Elsholtzia ciliata

Crested latesummer mint

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Elsholtzia ciliata is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentYoung leaves - raw or cooked[105, 177]. Finely cut then added to salads or used as a potherb[183]. The leaves can be used as an aromatic condiment for vegetable dishes[183]. The powdered seeds are used as a condiment for flavouring foodstuffs[272].

tcanta None known

dwatta Antibacterial Antipyretic Antiviral Astringent Carminative Depurative Diaphoretic Diuretic StomachicThe plant contains an essential oil[283]. It is antibacterial, antipyretic, antiviral, astringent, carminative, diaphoretic, diuretic and stomachic[61, 176, 178, 279]. Its use is said to relieve the effects of excess alcohol[61, 178]. It is used in the treatment of common colds, fevers, headaches, diarrhoea, oedema and oliguria[176, 279]. The plant has a broad-spectrum antibacterial action[176]. It is harvested when in flower and dried for later use[283].

propta Seed - sow late spring in situ[200].

nwatta An easily grown plant, it succeeds in most soils. Cultivated for ornament in N. and E. Europe[50].

### 5.2.510 Fritillaria cirrhosa

Chuan Bei Mu

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Fritillaria cirrhosa is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - boiled or roasted as a vegetable[272]. The bulb is bitter-sweet. The bulb is about 2cm in diameter[266].

tcanta None known

dwatta Antispasmodic Antitussive Demulcent Expecto-rant Febrifuge PectoralThe bulbs of Chuan bei mu are antitussive, astringent, demulcent, expectorant, febrifuge and pectoral[91, 176, 238]. They contain fritimine which lowers blood pressure, diminishes excitability of respiratory centres, paralyses voluntary movement and counters the effects of opium[61, 176, 238]. The dried bulb is used internally in the treatment of coughs, bronchitis, pneumonia, asthma, feverish illnesses, abscesses etc[238]. The bulbs also have a folk history of use against cancer of the breast and lungs in China[218, 238]. This remedy should only be used under

the supervision of a qualified practitioner, excessive doses can cause breathing difficulties and heart failure[238]. The bulbs are harvested in the winter whilst they are dormant and are dried for later use[238].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta Succeeds in a well-drained loamy soil[42]. Prefers peat bed conditions, the plant should not be allowed to dry out[134]. In cultivation at Kew[42] and thriving in a sunny stony bed at Keillour Castle in Perthshire[90], this species does not, however, do well in all gardens[1]. It is much valued as a herbal remedy in China[163]. This species is closely related to *F. meleagris*[42].

### 5.2.511 Cardamine impatiens

Narrowleaf bittercress

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc

hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine impatiens is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - raw or cooked[105, 177]. Used as a vegetable[272].

tcanta None known

dwatta Antirheumatic Diuretic StimulantThe plants is antirheumatic, diuretic and stimulant[145, 240].

propta Seed - sow spring or autumn in situ.

nwatta Succeeds in most soils[1]. Prefers a moist humus rich soil in shade or semi-shade[200].

### 5.2.512 Viola glabella

Stream Violet, Pioneer violet

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc

hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Viola glabella is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaYoung leaves and flower buds - raw or cooked[105]. When added to soup they thicken it in much the same way as okra[85, 159]. Some caution is advised, the yellow flowers of this species can cause diarrhoea if eaten in large quantities[62]. A tea can be made from the leaves[85].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to

nwatta Requires a dryish sunny position and a sandy loam[1]. Plants are tolerant of extreme cold but they are impatient of shade or excessive moisture[1].

#### 5.2.470 Lilium dauricum

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lilium dauricum is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb - cooked[46, 61, 74, 105]. The bulb is about 2m in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). Flowers[74]. No further details are given.

tcanta None known

dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. The formation of bulbils on the stem can be induced by either removing the stem at flowering time and layering it just below the soil surface, or by removing all the flowers before they open.

nwatta Succeeds in ordinary garden soil[143]. Prefers an open free-draining humus-rich loamy soil in a sunny position, it rapidly degenerates if grown in shade[143, 200]. Prefers an acid soil but tolerates lime[47, 200]. The dormant bulb is very hardy and has withstood soil temperatures down to -20°C, though the embryonic flower shoot will be damaged at temperatures around -15°C[214]. Stem rooting with a stoloniferous stem base, plant the bulbs 10 - 12cm deep[42, 143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1]. *L. spectabilis*, which is said to be a synonym of this species by many botanists, differs from this plant and therefore exists in its own right[74]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

#### 5.2.471 Valeriana sambucifolia

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 1.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Valeriana sambucifolia is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Condiment TeaYoung leaves - cooked[105]. Seed[172]. No further details are given but the seeds of other members of this genus are parched and then eaten. An essential oil from the leaves and root is used as a flavouring in ice cream, baked goods, condiments etc[183]. The leaves can also be used as a condiment[61]. The plant is used in moderation as a herbal tea[183].

tcanta Compost Essential Liquid feed RepellentThe plant yields about 1% of an essential oil from the roots[7, 238]. It is used in perfumery to provide a 'mossy' aroma[57, 61, 238], though the scent is considered to be disagreeable by many people[207]. The dried roots are also placed in linen cupboards and clothes drawers in order to scent the clothes[4]. The dried root attracts rats and cats, it can be used as a bait to lure them away from other areas[100]. An ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The plant can also be used to make a very good liquid plant feed[14, 18, 201]. It attracts earthworms[14, 18]. The leaves are very rich in phosphorus[201].

dwatta Antispasmodic Carminative Diuretic Eczema Hypnotic Nerve Sedative StimulantValerian is a well-known and frequently used medicinal herb that has a long and proven history of efficacy. It is noted especially for its effect as a tranquilliser and nerve, particularly for those people suffering from nervous overstrain[4, 222]. Valerian has been shown to encourage sleep, improve sleep quality and reduce blood pressure[254]. It is also used internally in the treatment of painful menstruation, cramps, hypertension, irritable bowel syndrome etc[238, 254]. It should not be prescribed for patients with liver problems[238]. Externally, it is used to treat eczema, ulcers and minor injuries[238]. The root is antispasmodic, carminative, diuretic, hypnotic, powerfully nerveine, sedative and stimulant[4, 7, 9, 14, 21, 46, 147, 165, 192, 218]. The active ingredients are called valepotriates, research has confirmed that these have a calming effect on agitated people, but are also a stimulant in cases of fatigue[222]. The roots of 2 year old plants are harvested in the autumn once the leaves have died down and are used fresh or dried[4, 9, 238]. The fresh root is about 3 times as effective as roots dried at 40° (the report does not specify if this is centigrade or fahrenheit), whilst temperatures above 82° destroy the active principle in the root[240]. Use with caution[21, 238], see the notes above on toxicity.

propta Seed - sow spring in a cold frame and only just cover the seed because it requires light for germination[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant out into their permanent positions in the summer if sufficient growth has been made. If the plants are too small to plant out, grow them on in the greenhouse or frame for their first winter and plant them out early in the following summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Succeeds in ordinary garden soil[1], preferring a moist site[7, 17]. Succeeds in full sun or in partial shade[233]. This species is considered to be no more than a sub-species of *V. officinalis* by many botanists[200], it has the same uses as that species[4]. Often grown in the herb garden and also sometimes grown commercially as a medicinal herb[1, 200]. Cats are very fond of this plant, particularly the powdered root[1, 4, 20]. The root also attracts rats[14]. A good companion for most plants.

### 5.2.472 Cirsium palustre

Marsh Thistle

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc

hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Cirsium palustre is a BIENNIAL growing to 1.5 m (5ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and

female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves Oil StemEdible Uses: Oil-Leaves and young shoots - raw or cooked[52, 100, 183]. Stems - raw or cooked like asparagus or rhubarb[4, 5, 12, 52, 105, 115]. The flower stalks are peeled and eaten raw or cooked[183].

tcanta Oil TinderThe seed fluff is used as a tinder[106]. The seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

dwatta None known

propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°c[164].

nwatta An easily grown plant, it succeeds in a sunny position in any ordinary garden soil so long as it is moist[200]. Tolerant of light shade, succeeding in woodlands[17]. A good bee and butterfly plant[17].

### 5.2.473 Lilium kelleyanum

Kelley's Lily

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium kelleyanum is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[46, 61]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanum tuberosum).

tcanta None known

dwatta None known

propta Seed - delayed hypogeal germination[130]. Autumnal hypogeal germination[200]. Best sown as soon as it is ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Stoloneriferous[200], the bulbs should be planted 10 - 12cm deep in a light, gritty, well-drained soil with added leafmold in sun or light shade[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

### 5.2.474 Hosta sieboldiana

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc pcmhmmihtut cyutli tcup hwicli hrasjlutnykifrip hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Hosta sieboldiana is a PERENNIAL growing to 1 m (3ft 3in) by 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked[105, 177].

tcanta A useful ground cover plant, succeeding in dense shade, though rather slow spreading[197]. Plants should be spaced about 60cm apart each way[200].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soil washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. A robust plant, densely clump-forming[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A very ornamental plant[1], there are many named forms[187]. Hybridizes freely with other members of this genus[200]. This species usually breeds quite true from seed[233].

### 5.2.475 Berberis concinna

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnykifrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis concinna is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruits - raw[272]. The fleshy oblong berries are up to 18mm long[11].

tcanta DyeA yellow dye is obtained from the roots and stems.

dwatta Antibacterial Cancer Dysentery Ophthalmic StomachicBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza

Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Plants are probably lime tolerant[143, 163, 200]. Succeeds in ordinary garden soil. Does well in limy soils and also succeeds in acid soils. Prefers a sunny position. A very ornamental[1] and easily grown plant[163]. The flowers are malodorous according to one report[143], whilst another says that they have a powerful oriental perfume[245]. Stem rooting, it is best planted 15cm deep in semi-shade[143, 200]. The plant should be protected against slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Bulbs are best planted out into their permanent positions in early to mid-autumn in cool temperate zones and up to late autumn in warmer areas, this allows them to become established before new top growth commences in spring[200].

### 5.2.507 Dianthus superbus

Fringed Pink

4 tin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyk hpa7tli flat-prikwlissip hpa7tmwatli xre7t hjonli

drutta Dianthus superbus is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves NectarEdible Uses: The leaves, stems and tops are boiled, steeped in water and eaten as a potherb[105, 177, 179, 183]. Young plants are also eaten[183]. One report says that they contain saponins but that the leaves are apparently not toxic[179]. Probably this is because the content of saponins is too low to be harmful[K]. Children suck the flowers for their sweet edible nectar[105, 177, 183].

tcanta None known

dwatta Abortifacient Antibacterial Astringent Contra-ceptive Diuretic Emmenagogue Febrifuge Haemostatic Ophthalmic Resolvent Tonic Urinary VulneryThe fringed pink, called Qu Mai in Chinese herbalism, has been used in Chinese herbal medicine for over 2,000 years. The whole plant is a bitter tonic herb that stimulates the digestive and urinary system, and also the bowels[238]. It also lowers blood pressure, reduces fevers and controls bacterial infections[218, 238]. Little used on its own, it is often taken with Dan Shen (Salvia multiorrhiza) to induce menstruation[254]. The closely related *D. chinensis* has the same uses as Qu Mai and is more commonly used[238]. The plant is abortifacient, contraceptive, diuretic, emmenagogue, ophthalmic, tonic and vulnery[147, 176, 178, 218]. It is said to promote hair growth[147, 176, 178]. It is ranked 9th in a list of 250 potential antifertility Chinese plants[218]. The plant is taken internally in the treatment of acute urinary tract infections (especially cystitis), urinary stones, constipation and failure to menstruate[238]. Externally, it is applied to skin inflammations and swellings[238]. The leaves are used in the treatment of haemorrhoids, lumbricoid worms, venereal sores etc[218]. The flowers are astringent, diuretic, haemostatic, resolvent and vulnery[218]. Research has shown that the flowers are the most markedly diuretic part of the plant[254].

propta Seed - sow April/June in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 weeks at 20°c. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the autumn.

nwatta Prefers an alkaline soil but tolerates slightly acid soils[200]. Succeeds in any well-drained peaty soil in sun or light shade[187]. Plants succeed when grown on the top of a broad or retaining wall[219]. A very hardy plant, tolerating temperatures down to about -20°c[187]. The flowers have a soft sweet perfume[245].

### 5.2.508 Orchis laxiflora

Marsh Orchis

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.8 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Orchis laxiflora is a BULB growing to 0.8 m (2ft 7in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: RootEdible Uses: DrinkRoot - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Antiflatulent Astringent Cancer Demulcent Expectorant NutritiveUsed in the treatment of cancer[148]. Salep (see above for more details) is very nutritive, astringent, expectorant and demulcent[4, 240]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Requires a deep rich soil[1]. Plants can succeed in drier areas of bog gardens[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This

a year if you want the plants to continue growing, three cuts annually will weaken and eventually kill off the plants. The dried ferns produce a very durable thatch[4]. The leaves are used as a packing material for fruit, keeping it fresh and cool without imparting any colour or flavour[4, 66, 99]. They are also used as a lining for baskets, fruit drying racks etc and as a bedding[66, 99]. The leaves repel insects and can help to prevent rot in the fruits etc[99]. Dried bracken fronds are very useful in the garden as a mulch for somewhat tender plants. This will keep the soil warmer, protect from wind damage and also keep off some of the rain[4, K].

dwatta Anthelmintic Antiemetic Antirheumatic Diuretic Febrifuge PoulticeThe young shoots are diuretic, refrigerant and vermifuge[4, 46, 94, 218]. They have been eaten as a treatment for cancer[257]. The leaves have been used in a steam bath as a treatment for arthritis[257]. A decoction of the plant as been used in the treatment of tuberculosis[257]. A poultice of the pounded fronds and leaves has been used to treat sores of any type and also to bind broken bones in place[257]. The root is antiemetic, antiseptic, appetizer and tonic[257]. A tincture of the root in wine is used in the treatment of rheumatism[218]. A tea made from the roots is used in the treatment of stomach cramps, chest pains, internal bleeding, diarrhoea, colds and also to expel worms[4, 46, 94, 222, 257]. The poulticed root is applied to sores, burns and caked breasts[222, 257].

propta Spores can be surface sown in the same way as other ferns but this plant really does not need any help in spreading itself about. Division is also possible but totally unnecessary in most circumstances.

nwatta Prefers a light, acid, deep sandy soil[1]. Dislikes shade according to some reports[13, 17] whilst another says that it tolerates full sun but prefers light shade[200]. Prefers a pH in the range 4 to 6[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. This is an extremely invasive plant and is a noxious weed. Plants can be cut down twice a year to provide compost material, this will not kill the plants. If the plants are cut down three times a year this will gradually weaken and eventually kill them.

## 5.2.505 Dictamnus albus

Burning Bush, Gasplant, White Dittany, 4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc htut cyutli hgtakyuuctcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Dictamnus albus is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: TeaA lemon-scented tea is made from the dried leaves[21, 46, 61]. Refreshing and aromatic[183].

tcanta EssentialThe plant contains an essential oil[211]. Yields from the fresh flowering plant are around 3% on a dry weight basis[240]. This oil is used as a cosmetic[4].

dwatta Abortifacient Anthelmintic Antibacterial Anticonvulsant Antirheumatic Antispasmodic Aromatic Digestive Diuretic Eczema Emmenagogue Expectorant Febrifuge Galactagogue Homeopathy Stimulant TonicThe burning bush has been used in Chinese herbal medicine for at least 1,500 years[238]. The root bark is a bitter, strong-smelling herb that lowers fevers and controls bacterial and fungal infections[238]. The plant has an effect similar to rue (Ruta graveolens) in that it strongly stimulates the muscles of the uterus, inducing menstruation and sometimes causing abortion[254]. By contrast, its effect upon the gastro-intestinal tract is antispasmodic and it acts as a mild tonic on the stomach[254]. Both the flowering stems and the root-bark are used medicinally[7]. They are abortifacient, anthelmintic, antispasmodic, aromatic, digestive, diuretic, emmenagogue, expectorant, febrifuge, galactagogue, stimulant and tonic[7, 9, 19, 21, 46, 178, 211]. The plant is used both internally and externally in the treatment of skin diseases (especially scabies and eczema), German measles, arthritic pain and

jaundice[238]. It is little used in Western herbalism nowadays, though it has been recommended for use in nervous complaints, intermittent fevers, scrofulous and scorbutic diseases[4]. Use with caution, in large doses it is poisonous[9, 21]. The root bark is harvested in the autumn and dried for later use[238]. An infusion of the leaves is used as a tea substitute and is a good digestive[7]. A homeopathic remedy is made from the fresh leaves[9]. It is used in the treatment of female complaints and constipation[9].

propta Seed - best sown in a cold frame as soon as it is ripe[175]. Cold stratify stored seed for 6 weeks and sow in the spring in a cold frame[175]. The seed usually germinates in 1 - 6 months at 15°c[175]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[1]. Take care since the plant resents root disturbance[1]. The plant can also be divided in autumn[200]. We have found it best to tease out divisions from the side of the clump to avoid the need to dig up the main clump. Try to get divisions that already have formed roots. Pot them up in a greenhouse and grow them on for a year to make sure they are well established before planting them out. Root cuttings in November/December.

nwatta Landscape Uses:Border, Foundation, Massing, Rock garden, Specimen, Woodland garden. An easily grown plant, succeeding in ordinary garden soil[1]. It prefers a dry sunny position with some lime[1, 108] and is not suitable for heavy or damp soils[111]. Established plants are drought tolerant[190]. A very ornamental plant[1], it should be planted into its permanent position as soon as possible because it dislikes root disturbance[1, 175]. The whole plant contains a very aromatic essential oil, giving out a scent somewhat like lemon peel[4]. When the plant is bruised, this smell becomes more like fine balsam[4]. This essential oil is emitted from the plant in hot weather and, on a still day, can be ignited and will burn for a second or two without harming the plant, thus giving the plant its common name[1, 4, 13, 187]. Slugs are strongly attracted to this plant and can destroy it by eating all the young growth in spring[K]. There are at least 2 named varieties, 'Pink' produces a tea with a less lemony flavour but with an added taste of almonds and vanilla, 'White' has a lemony fragrance and taste[183]. The flowers are very attractive to bees[108]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, All or parts of this plant are poisonous. Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

## 5.2.506 Lilium amabile

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Lilium amabile is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - cooked[105, 183]. The bulb is 25 - 30mm in diameter[266]. It can be used as a vegetable in similar ways to potatoes. Flower buds - cooked[105, 177, 183]. Young shoots - cooked[105, 177, 183]. Eating the young shoots will prevent the bulb from growing any more in that year with a consequent loss of vigour or even the death of the plant, so is not to be recommended[K].

tcanta None known dwatta None known propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth.

species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Hybridizes freely with other members of this genus[1]. A very ornamental plant[11]. Plants can be pruned back quite severely and resprout well from the base[200].

## 5.2.476 Helianthus doronicoides

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Helianthus doronicoides is a PERENNIAL growing to 1.8 m (6ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Tubers - cooked[2, 46, 61]. A similar taste to Jerusalem artichokes but less productive because the tubers are very thin[K].

tcanta None known dwatta None known propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in moist soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. Plants have a running root system and can be invasive in suitable conditions[233]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Possibly a naturally occurring hybrid, *H. giganteus* x *H. molis*[200].

## 5.2.477 Lilium davidii

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Lilium davidii is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium

(loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[105, 143]. One of the larger lily bulbs, it is up to 45mm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known dwatta None known propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulbets. These bulbets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. The formation of bulbils on the stem can be induced by either removing the stem at flowering time and layering it just below the soil surface, or by removing all the flowers before they open.

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. An easily grown plant, it tolerates some lime in the soil[143, 163, 200]. Stem rooting, the bulbs should be planted 15 - 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[143]. This species is occasionally cultivated for its edible bulb in China[143]. The plant is widely cultivated for its root according to another report[266]. Closely allied to *L. willmotiae*[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.478 Lilium formosanum

Formosa lily 4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium formosanum is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[105, 177]. The bulb can be up to 4cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known dwatta None known propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. This species can flower within a year from seed, especially if sown in the early autumn[143]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulbets. These bulbets can

be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. This species only tolerates temperatures down to about -3°C[260]. It is not fully hardy outside the mildest parts of Britain and is best grown as an annual or biennial in a cool greenhouse where it can flower in the first year from seed[143, 260]. In a warm climate the plant grows continually and will grow happily in pots in a conservatory[260]. The bulbs can be crammed into the pot with crocks below to give good drainage and a good loose compost above[260]. The form 'Price's var.' is an alpine form of the species, it breeds true from seed and it is hardy if grown in a sheltered spot in the rock garden[143]. The flowers diffuse a delicious sweet perfume[245]. Stem rooting, the bulbs should be planted 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.479 Allium aflatunense

Persian Onion, Ornamental Onion

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Allium aflatunense is a BULB growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked. The bulb varies greatly in size, from 2 - 6cm[200]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe growing plant is said to repel insects and moles[20].

dwatta AntibioticThe plant possesses outstanding germicidal properties, all cultures being destroyed under its influence[240]. Although no other specific mention has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Landscape Uses:Container, Foundation, Massing, Rock garden, Seashore, Specimen. Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. This species does not have the characteristic garlic smell of most members of the genus[200]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Fragrant foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

## 5.2.480 Artemisia ludoviciana

White Sage, Louisiana Sage, Prairie Sage, Western Mugwort  
4 tin 9 cyuc 2 kcaak 2 tcan 2 dwat 1 m hkuc  
hmimhtut cyutli hqatkyuctcup hwicli hrasjlut hpa7tli priklwis  
hpa7tmwatli xre7t hjonli

drutta Artemisia ludoviciana is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: Condiment TeaLeaves and flowering heads are used as a flavouring or garnish for sauces, gravies etc[183]. A herb tea is made from the leaves and flowering heads[183]. Seed[105, 161, 177, 183]. No further details are given but the seed is very small and fiddly to use.

tcanta Deodorant RepellentThe plant makes a useful ground cover plant once it is established[190]. The leaves can be placed in the shoes as a foot deodorant[257]. An infusion of the leaves has been used as an underarm deodorant[257]. The soft leaves can be used as a toilet paper[257]. The plant can be burnt to repel mosquitoes[257].

dwatta Astringent Deodorant Eczema Poultice SkinThe leaves are astringent[222]. They were commonly used by the N. American Indians to induce sweating, curb pain and diarrhoea[222]. A weak tea was used in the treatment of stomach ache and menstrual disorders[222]. Externally, a wash of the leaves was applied to itching, rashes, swellings, boils, sores, etc[222]. The wash was also applied to eczema and as an underarm deodorant[257]. A poultice of the leaves can be applied to spider bites, blisters and burst boils[257]. A sniff of the crushed leaves has been used to treat headaches, the sinuses and nosebleeds[257].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Experimental Crop Industrial Crop: Hydrocarbon Management: CoppiceLandscape Uses:Border, Container, Ground cover, Massing, Seashore. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Does well in a sandy soil[188]. Established plants are very drought tolerant[190]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. A very polymorphic species[43]. Slugs love the young shoots of this plant and have been known to destroy even well-established plants[K]. A very ornamental plant, spreading by stolons to form loose patches[187], it can be invasive[190]. There are many named forms selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Fragrant foliage, Invasive, Suitable for dried flowers.

## 5.2.481 Sanguisorba officinalis

Great Burnet

4 tin 8 cyuc 2 kcaak 2 tcan 3 dwat 1 m hkuc  
hmimhtut cyutli kyuctcuphja7n hwicli hyishrasjlutnyik  
hpa7tli flatpriklwisslip hpa7tmwatli fyifkre7t hjonli

drutta Sanguisorba officinalis is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can

tolerate in the growing season[200]. Plants are hardy to at least -15°C[238]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.502 Polygonatum verticillatum

Whorled Solomon's Seal

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat-  
priklwis hpa7tmwatli fyifkre7t hjonli

drutta Polygonatum verticillatum is a PERENNIAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Tender leaves and young shoots - cooked as a vegetable[51, 272]. They can be used as an asparagus substitute. Root - cooked[105]. Rich in starch.

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots are very attractive to slugs[K]. Hybridizes with other members of this genus[200].

## 5.2.503 Elymus glauca

Blue Wild Rye

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik-  
lwis hpa7tmwatli xre7t hjonli

drutta Elymus glauca is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH:

mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: Seed - cooked[105, 161]. It can be ground into a flour and used to make bread. Very fiddly to use, the seed is small and difficult to extract[K].

tcanta Soil stabilization WeavingThe leaves are used for making mats, rope, paper etc. Often planted near the coast to stabilize sand dunes.

dwatta None known

propta Seed - sow mid spring in situ and only just cover the seed[162]. Germination should take place within 2 weeks. If the supply of seed is limited, it can also be sown in mid spring in a cold frame. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in summer[K] Division in spring or summer[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, it succeeds in most soils, preferring a sandy soil and a sunny position[1, 162].

## 5.2.504 Pteridium aquilinum esculentum

Bracken

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 1.2 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat-  
prik hpa7tmwatli hjonli

drutta Pteridium aquilinum esculentum is a FERN growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4. The seeds ripen from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: SweetenerRoot - rich in a white starch that can be eaten raw or cooked[193]. It can also be dried and ground into a powder[2, 13, 46, 55, 66, 94, 95, 102]. The root is very fibrous[173]. When dried, it will store for years[173]. The root contains 60% starch[74]. The dry weight content of starch is between 43 and 72%[173]. This starch can be extracted from the roots and is used in making dumplings which are eaten with soya flour and sugar as a delicacy[183]. Young shoots - raw or cooked[2, 13, 55, 62, 94, 102, 183]. They can be used like asparagus or like spinach[9]. Somewhat flavourless, though they are considered to be a delicacy in Japan[4]. The fronds should be used when less than 20cm long, longer ones have a terrible taste[9, 213]. The shoots are somewhat bitter so they are often blanched for a few minutes in boiling water, then left to soak in cold water for two hours before being cooked[4, 9]. Although this might well improve the flavour, it will greatly reduce the nutritional value[K]. The shoots should be steeped in lye first[55]. Occasional use should cause no problems, but regular consumption is not advisable because the shoots might be carcinogenic[9, 65]. The plant yields an edible saccharine substance[55]. (from the cooking root???)

tcanta Adhesive Basketry Biomass Compost Dye Hair Lining Packing Repellent Soap Soap making Stuffing TinderA glue can be made from the rootstock[74]. A brown dye is obtained from the fronds[6, 67, 141]. It is green according to another report[141]. The fibrous remnants from edible roots make a good tinder[99]. The rhizome lathers readily in water and can be used as a soap[74]. A decoction of the root has been used as a hair wash[257]. The roots have been rubbed into the scalp in order to promote hair growth[257]. The roots have been pounded to remove the bark, then split into flat bands and used as the black strands of cheap baskets[257]. The ashes of the plant are rich in potassium and could be used as a fertilizer[4]. They are also used in the manufacture of glass (when mixed with sand) and in making soap (when mixed with vegetable oil)[4, 74]. The roots contain up to 20% potash in early summer, but this reduces to about 5% in the autumn[4]. The whole plant is a very valuable addition to the compost heap, it is rich in potash and makes an excellent compost for tree seeds[67, 94]. Cut twice

be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta Landscape Uses:**Border, Massing, Rock garden, Specimen. Requires a sunny position and a well-drained soil containing lime[42]. Easily cultivated in a sunny position in ordinary garden soil[187]. Prefers a pH between 6 and 7.5 or higher[200]. Established plants are drought tolerant[190]. Cultivated, especially in Italy, for the essential oil in its root[4]. The flowers are sweetly scented, reminding some people of orange blossom, others of vanilla and others of civet[245]. A very vigorous species[42]. The rhizome should be planted partly above the soil[1]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. **Special Features:** Attractive foliage, Fragrant foliage, All or parts of this plant are poisonous.

## 5.2.499 Angelica gigas

Giant Angelica, Purple Parsnip, Korean Angelica

4 tlin 8 cyuc 2 kcaok 0 tcan 2 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrsajlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Angelica gigas is a PERENNIAL growing to 1.8 m (6ft) at a medium rate. It is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaakta Edible Parts:** Leaves**Edible Uses:** Young leaves - cooked[177, 183].

**tcanta None known**

**dwatta Blood tonic Women's complaints**The root is used in Korea to treat anaemia, hemiplegia and women's diseases[279]. It contains a number of active compounds and has been shown to increase duodenum motility and have an anti-platelet aggregation action[279].

**propta Seed** - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

**nwatta Landscape Uses:**Specimen, Woodland garden. Requires a deep moist fertile soil in dappled shade or full sun[200]. Hardy to about -20°C[187]. Plants flower in 2 years from seed[187] and are reliably perennial if prevented from setting seed[200]. **Special Features:** Attractive foliage, Naturalizing.

## 5.2.500 Lilium japonicum platyfolium

Bamboo Lily

4 tlin 8 cyuc 2 kcaok 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hysjraslut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium japonicum platyfolium is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaakta Edible Parts:** Root**Edible Uses:** Bulb - cooked[2, 4, 105]. It contains about 18% starch[174]. A slightly bitter taste[174]. It can be used as a vegetable in similar ways to potatoes(Solanum tuberosum).

**tcanta None known**

**dwatta Antiasthmatic Antitussive Expectorant Nutritive Sedative Tonic**The bulb is antiasthmatic, antitussive, expectorant, sedative and tonic (nutritive)[174, 176]. It is used in the treatment of coughs, haemoptysis, insomnia and fidgetiness in the later stage of febrile disease[176].

**propta Seed** - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

**nwatta** Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Grows well in open woodland[1]. Likes plenty of moisture and some shade[42, 47]. Just to totally confuse matters, one report says that this species prefers a poor gravelly loam with plenty of leafmold and some charcoal, in a sunny position[143]. Requires protection from winter rains[143]. This sub-species is more vigorous than the type and has broader leaves. Stem rooting, the bulbs should be planted 15 - 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1], it is cultivated for its bulb in Japan[2] and is also a sacred flower in Japanese Shinto rites[174]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.501 Pycnanthemum virginianum

Virginia Mountain Mint

4 tlin 8 cyuc 2 kcaok 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli kyuctup hwicli hrsajlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Pycnanthemum virginianum is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcaakta Edible Parts:** **Edible Uses:** Condiment TeaFlower buds and leaves - raw or cooked. A mint-like flavour, they make a nice addition to salads or can be used as a condiment[61, 161, 183, 238]. The fresh or dried leaves are brewed into a refreshing mint-like tea[183].

**tcanta None known**

**dwatta Alternative Analgesic Carminative Diaphoretic Febrifuge**A tea made from the leaves is alternative, diaphoretic and carminative[222, 257]. A poultice of the leaves is used in the treatment of headaches[222]. The tea is also used in the treatment of menstrual disorders, indigestion, colic, coughs, colds, chills and fevers[222, 238, 257].The flowering stems are cut as flowering begins and they can be used fresh or dried[238]. There is a suggestion that this plant can cause abortions, so it is best not used by pregnant women[257].

**propta Seed** - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If there are sufficient seeds they can be sown in an outdoor seedbed in April. Division in spring.

**nwatta** Succeeds in most soils[1] but prefers a rich loamy soil in full sun or partial shade with plenty of mois-

grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

**kcaakta Edible Parts:** Leaves**Edible Uses:** TeaYoung leaves and flower buds - raw or cooked[13, 61, 105]. They should be harvested in the spring before the plant comes into flower[9]. A cucumber flavour[7, 46], they can be added to salads or used as a potherb[183]. The fresh or dried leaves are used as a tea substitute[183].

**tcanta Tannin**The roots contain tannin[7].

**dwatta Anodyne Antidiarrhoeic Astringent Contraceptive Diuretic Dysentery Eczema Febrifuge Haemostatic Tonic Vulnery**Great burnet is employed mainly for its astringent action, being used to slow or arrest blood flow. It is taken both internally and externally internally and is a safe and effective treatment. Modern research in China has shown that the whole herb heals burns more effectively than the extracted tannins (the astringent component of the plant)[254]. Patients suffering from eczema showed marked improvement when treated with an ointment made from the root and petroleum jelly[254]. The leaves are astringent, refrigerant, styptic and tonic[7, 218, 222]. They are used in the treatment of fevers and bleeding[218, 222]. The plant is prevented from flowering and then the leaves are harvested in July and dried for later use[4, 238]. The root is anodyne, astringent, diuretic, febrifuge, haemostatic, tonic and vulnerary[4, 7, 9, 21, 147, 165, 176, 178, 218]. It is used in the treatment of peptic ulcers, haematuria, menorrhagia, bloody stool, dysentery, diarrhoea, haemorrhoids and burns[176]. The root is harvested in the autumn as the leaves die down and dried for later use[4, 238]. All parts of the plant are astringent, but the root is most active[4]. Great burnet is an excellent internal treatment for all sorts of abnormal discharges including diarrhoea, dysentery and leucorrhoea[4]. It is used externally in the treatment of burns, scalds, sores and skin diseases[238]. This species was ranked 19th in a Chinese survey of 250 potential anti-fertility plants[218].

**propta Seed** - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out as soon as they have reached a reasonable size. The seed can also be sown in situ in early spring[4]. Division in the spring or in autumn[4].

**nwatta** Succeeds in ordinary garden soil[1]. Prefers a good moist soil that does not dry out in the summer, in sun or partial shade[187, 200]. Plants grow tolerably well in very poor soils and likes a dry chalky soil[4]. This species is hardy to about -25°C[187]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.482 Physalis subglabrata

Longleaf groundcherry

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli kyuctup hwicli hrsajlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Physalis subglabrata is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from May to October, in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcaakta Edible Parts:** Fruit**Edible Uses:** Edible fruit - raw or cooked[85]. The plant conveniently wraps up each fruit in

its own 'paper bag' (botanically, the calyx) to protect it from pests and the elements. This calyx is toxic and should not be eaten.

**tcanta None known**

**dwatta None known**

**propta Seed** - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out after the last expected frosts. Consider giving them some protection such as a cloche until they are growing away well. Diurnal temperature fluctuations assist germination[170]. Division in spring[111]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in early summer[111]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta** We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors at least in the milder parts of this country. If it proves to be tender, it should be possible to treat it as an annual, sowing the seed in early spring in a warm greenhouse and planting out after the last expected frosts[K]. There is some confusion over the name of this species, it might be best treated as a sub-species of *P. virginiana*, when it will be *P. virginiana subglabrata*. (MacKenzie. and Bush.)Waterfall. The plant has a deep rootstock[235]. The following notes are based on the general needs of the genus. Succeeds in any well-drained soil in full sun or light shade[200].

## 5.2.483 Pteridium aquilinum

Bracken, Western brackenfern, Decomposition brackenfern, Hairy brackenfern

4 tlin 7 cyuc 2 kcaok 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli kyuctup hwicli hrsajlutnyik hpa7tli frusflat-prik hpa7tmwatli hjonli

drutta Pteridium aquilinum is a FERN growing to 1.2 m (4ft) by 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The seeds ripen from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

**kcaakta Edible Parts:** Leaves **RootEdible Uses:** Sweetener**Root** - cooked. It can be dried and ground into a powder[2, 13, 46, 55, 66, 94, 95, 102, 257]. The root is very fibrous so traditionally it was baked after being dried, the outer skin was peeled off and the roots pounded into a powder with sticks so that the inner fibres could be removed[173, 256]. The dried root will store for years[173]. The root contains 60% starch[74]. The dry weight content of starch is between 43 and 72%[173]. This starch can be extracted from the roots and is used in making dumplings which are eaten with soya flour and sugar as a delicacy[183]. The root has a somewhat constipating effect upon the body so is best eaten with foods that have a laxative quality[256]. Young shoots, harvested when still unfurling, can be eaten raw or cooked[2, 13, 55, 62, 94, 102, 183, 257]. They can be used like asparagus or like spinach[9, 257]. Somewhat flavourless, though they are considered to be a delicacy in Japan[4]. The fronds should be used when less than 20cm long, longer ones have a terrible taste[9, 213]. The shoots are somewhat bitter so they are often blanched for a few minutes in boiling water, then left to soak in cold water for two hours before being cooked[4, 9]. Although this might well improve the flavour, it will greatly reduce the nutritional value[K]. The shoots should be steeped in lye first[55]. Occasional use should cause no problems, but regular consumption is not advisable because the shoots might be carcinogenic[9, 65]. The plant yields an edible saccharine substance[55]. (From the cooking root???)

**tcanta Adhesive Basketry Biomass Compost Dye Hair Lining Mulch Packing Repellent Soap Soap making Stuffing Thatching Tinder**A glue can be made from the rootstock[74].

A brown dye is obtained from the fronds[6, 67, 141]. It is green according to another report[141]. The fibrous remnants from edible roots make a good tinder[99]. The rhizome lathers readily in water and can be used as a soap[74]. A decoction of the root has been used as a hair wash[257]. The roots have been rubbed into the scalp in order to promote hair growth[257]. The roots have been pounded to remove the bark, then split into flat bands and used as the black strands of cheap baskets[257]. The ashes of the plant are rich in potassium and could be used as a fertilizer[4]. They are also used in the manufacture of glass (when mixed with sand) and in making soap (when mixed with vegetable oil)[4, 74]. The roots contain up to 20% potash in early summer, but this reduces to about 5% in the autumn[4]. The whole plant is a very valuable addition to the compost heap, it is rich in potash and makes an excellent compost for tree seeds[67, 94]. Cut twice a year if you want the plants to continue growing, three cuts annually will weaken and eventually kill off the plants. The dried ferns produce a very durable thatch[4]. The leaves are used as a packing material for fruit, keeping it fresh and cool without imparting any colour or flavour[4, 66, 99]. They are also used as a lining for baskets, fruit drying racks etc and as a bedding[66, 99]. The leaves repel insects and can help to prevent rot in the fruits etc[99]. Dried bracken fronds are very useful in the garden as a mulch for somewhat tender plants. This will keep the soil warmer, protect from wind damage and also keep off some of the rain[4, K].

dwatta Anthelmintic Antiemetic Antiseptic Diuretic Poulitce Refrigerant TonicThe young shoots are diuretic, refrigerant and vermifuge[4, 46, 94, 218]. They have been eaten as a treatment for cancer[257]. The leaves have been used in a steam bath as a treatment for arthritis[257]. A decoction of the plant as been used in the treatment of tuberculosis[257]. A poultice of the pounded fronds and leaves has been used to treat sores of any type and also to bind broken bones in place[257]. The root is antiemetic, antiseptic, appetizer and tonic[257]. A tincture of the root in wine is used in the treatment of rheumatism[218]. A tea made from the roots is used in the treatment of stomach cramps, chest pains, internal bleeding, diarrhoea, colds and also to expel worms[4, 46, 94, 222, 257]. The poulticed root is applied to sores, burns and caked breasts[222, 257].

propta Spores can be sature sown in the same way as other ferns but this plant really does not need any help in spreading itself about. Division is also possible but usually totally unnecessary.

nwatta Landscape Uses:Border, Foundation, Rock garden, Woodland garden. Prefers a light, acid, deep sandy soil[1]. Dislikes shade according to some reports[13, 17] whilst another says that it tolerates full sun but prefers light shade[200]. Prefers a pH in the range 4 to 6[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. This is an extremely invasive plant and is a noxious weed. It is one of the most widespread plants in the world, being found in all parts of the globe other than the extreme north and south[4]. Plants can be cut down twice a year to provide compost material, this will not kill the plants. If the plants are cut down three times a year this will gradually weaken and eventually kill them. Special Features:Attractive foliage, Not North American native, Invasive, All or parts of this plant are poisonous, There are no flowers or blooms.

### 5.2.484 Lilium leichtlinii

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium leichtlinii is a BULB growing to 1.2 m (4ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[85, 105]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known

dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Requires a light humus-rich acid soil and plenty of moisture in late spring[47]. Should succeed in a cool well-drained peat, leaf-mold and sand mix with shelter from the midday sun[42]. Plants are best grown in a greenhouse border in Britain[1]. This species could be one of the parents of *L. lancifolium*[90]. Stem rooting, the bulbs should be planted 15cm deep[42, 200]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. It is said that this species is very difficult to grow[143] whilst its variety *L. leichtlinii maximowiczii* is much easier[42], but this is not necessarily the case[47]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

#### 5.2.485 Cicerbita alpina

Blue Sow Thistle

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli fyfexre7t hjonli

drutta Cicerbita alpina is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young shoots and stems - raw[4, 105]. The skin is first removed, but the shoots are still rather bitter and unpalatable[4, K]. Older stems can also be peeled and eaten raw[105, 177, 183] but have a bitter taste[2].

tcanta None known

dwatta Antiphlogistic DiureticThe leaves and milky sap were at one time often used in herbal medicine, though are seldom employed nowadays[4]. They are diuretic and are also applied externally to inflammations[4].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not let the compost dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in spring[188]. We have found it best to pot up the clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist well-drained humus rich neutral to acid light sandy soil and some shade[1, 187, 200]. Plants are hardy to at least -20°c[187].

#### 5.2.486 Ribes cereum

Wax Currant

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 1.8 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Grows well near water[1]. Repays generous treatment[1]. Plants seem to be immune to the predations of rabbits[233]. Plants can be invasive but they are easily controlled by spading around the clump[200].

#### 5.2.497 Yucca glauca

Soapweed, Soapweed yucca, Gurney's yucca, American Vetch, Yucca, Narrowleaf Yucca, Soapweed
4 tin 10 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Yucca glauca is an evergreen Shrub growing to 1.5 m (5ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Fruit Leaves Seedpod StemEdible

Uses: Fruit - raw or cooked[2, 46, 61, 161, 257]. Dry, with a bitter skin[85]. The fruit can be baked and either eaten immediately or formed into cakes and dried for later use[257]. The raw fruit can be dried for winter use[1, 257]. The immature fruits are peeled, boiled and served with seasonings[183]. The soaked, cooked fruit can be made into a syrup and used like hot chocolate[257]. The fruit is up to 8cm long and 12mm wide[2]. Flowers and flower buds - raw or cooked[61, 85]. Delicious raw, they can also be dried, crushed and used as a flavouring[164]. A delicious addition to the salad bowl, or used as a potherb[183]. Flowering stem - raw or cooked[62, 85, 161, 257]. It can be cooked and used like asparagus[164]. The white inner portion of the stem is eaten[183]. Seedpods - cooked. They can be boiled or roasted and used as a vegetable[257]. The plant crowns have been roasted and eaten in times of food shortage[257].

tcanta Basketry Broom Brush Fibre Hair Needles Soap String WeavingBoth the leaves, and a fibre obtained from the leaves, can be used for making cloth, ropes and mats[21, 57, 61, 82, 85, 169, 257]. The leaves can be split and used to make baskets[257]. The leaves are used as paint brushes and brooms[46, 85, 92]. The leaves can be split and used as a temporary tying material[257]. The sharp points of the leaves have been used as needles[257]. The roots are rich in saponins and can be used as a soap substitute[82, 85, 95]. The soap obtained from the root makes a good hair shampoo[95], it is said to be effective against dandruff and also to act as a tonic to stop the hair falling out[213, 257]. The shampoo also rids the body of lice and other parasites[257].

dwatta Antidandruff Contraceptive Oxytoxic Poulitce SkinA soap made from the crushed roots is said to be an effective treatment for dandruff and skin irritations[213, 222]. A cold infusion of the root has been used to expedite the delivery of a child or the placenta[257]. The root is poulticed and applied to inflammations, wounds, bleeding cuts, sprains etc[222, 257]. The rotten root can be crushed and boiled to make suds. Drinking these suds is said to induce the menopause in women, thereby rendering them infertile[257].

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°c. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in

Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots in a greenhouse until established[78]. Division of suckers in late spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Landscape Uses:Border, Erosion control, Massing, Rock garden, Seashore, Specimen. Thrives in most soils but prefers a sandy loam and full exposure to the south[11]. Dislikes chalky or peaty soils[111]. Can succeed in light shade[K]. Plants are hardier when grown on poor sandy soils[200]. Prefers a hot dry position and a poor soil[166]. Established plants are very drought tolerant[200]. Hardy to at least -30°c according to one report[164], whilst another one says that it is hardy to about -15°c[200]. A very ornamental plant[1], it rarely flowers unless in a dry sandy soil[42]. The scent of the flowers is most pronounced at night[245]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush[1]. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in later years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]. Special Features:Attractive foliage, North American native.

#### 5.2.498 Iris pallida

Dalmation Iris, Sweet Iris, Fragrant Iris, Zebra Iris

4 tin 10 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwssip hpa7tmwatli fyfexre7t hjonli

drutta Iris pallida is a PERENNIAL growing to 1 m (3ft 3in) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentThe root can be dried, ground into a powder and used as a food flavouring[46, 171]. The root may take several years of drying to develop its full fragrance[168]. 'Orris oil' is an essential oil derived from the dried root, it is used as a flavouring in soft drinks, sweets, chewing gum etc[183].

tcanta Cosmetic Dye EssentialThe root is a source of Orris powder which has the scent of violets[238]. It is obtained by grinding up the dried root[4, 7, 46]. It is much used as a fixative in perfumery and pot-pourri, as an ingredient of toothpastes, breath fresheners etc and as a food flavouring. The root can take several years of drying to fully develop its fragrance, when fresh it has an acrid flavour and almost no smell[4, 168]. An essential oil is obtained from the fresh root, this has the same uses as the root[57, 61]. The juice of the root is sometimes used as a cosmetic and also for the removal of freckles from the skin[4]. A black dye is obtained from the root[168]. A blue dye is obtained from the flowers[168]. Plants can be grown for ground cover, the dense mat of roots excluding all weeds[208].

dwatta CatharticCathartic[4]. The juice of the fresh root is a strong purg of great efficiency in the treatment of dropsy[4].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done after flowering, though it can be done at almost any time. Very easy, larger clumps can



*P. sinensis*[11, 109]. Flowers are produced very early in the spring and they are then easily damaged by frosts[11]. The flowers are produced on the previous seasons wood[200]. They are produced on old wood according to another report[182]. Plants only fruit in Britain after long hot summers[200].

## 5.2.494 Berberis everstiana

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli kyuctup hwicli hyshraslutnyikfrp hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta *Berberis everstiana* is a SHRUB growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[272]. The fleshy oblong fruit is about 15mm long.

tcanta DyeA yellow dye is obtained from the root and bark.

dwatta Antibacterial Cancer Dysentery Ophthalmic StomachicBerberine, universally present in rhizomes of *Berberis* species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[11, 113]. Pot up in the spring[113]. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Hybridizes freely with other members of this genus[1]. Closely related to *B. tsangpoensis*[11]. Plants can be pruned back quite severely, they resprout well from the base[200].

## 5.2.495 Lilium speciosum

Oriental Lily

4 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hraslut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Lilium speciosum* is a BULB growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[2, 105, 163, 266]. The bulb is about 5cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known

dwatta The bulb is used medicinally[266]. No further information is given.

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Landscape Uses:Border, Container, Seashore, Specimen. Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Dislikes lime[42]. Prefers a light sandy loam with plenty of leafmold[47]. Best grown in open woodland or amongst dwarf evergreens[1]. Prefers a sunny position[42, 143]. The dormant bulbs are fairly hardy and will withstand soil temperatures down to at least -5°C[214]. Stem rooting, the bulbs should be planted 25 - 30cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1] it is easily grown[163] but requires a long growing season if it is to do well[200]. The flowers diffuse a powerful sweet honey perfume[245]. Cultivated for its edible bulb in Japan[2]. The sub-species *L. speciosum rubrum*. Mast. ex Bak. is said to be inedible whilst *L. speciosum album*. Mast. ex Bak. is said to be acceptable for eating[163]. The variety 'Magnificum' is said to be the best form for growing outdoors in Britain[245]. Plants take 4 years to flower from seed[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Special Features: Not North American native, Attracts butterflies, Suitable for cut flowers, Fragrant flowers, Attractive flowers or blooms.

## 5.2.496 Polygonum alpinum

Alpine Knotweed, Alaska wild rhubarb

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hraslutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Polygonum alpinum* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Seed StemEdible Uses: DrinkLeaves - raw or cooked[2, 145]. They have an acid flavour and can be used as a sorrel substitute[74]. The chopped leaves and stems have been added to a thick pudding of flour and sugar then eaten[257]. Leaf stems - raw or cooked. An acid flavour, they can be cut into sections and used like rhubarb (*Rheum spp*) [257]. The juice from the plant has been sweetened and used as a refreshing drink[257]. Seed - raw or cooked. It is rather small and fiddly to utilize.

tcanta None known

dwatta Astringent PectoralThe whole plant is astringent[74]. The raw roots and stem bases have been chewed as a treatment for coughs and colds[257].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the

drutta *Ribes cereum* is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Fruit LeavesEdible Uses: Fruit - raw or cooked[62, 101, 161, 183]. Not very nice, large quantities can cause nausea[85]. Reports on the quality of the fruit range from insipid and rubbery to highly esteemed as an article of diet[257]. The fruit can also be used to make pemmican, jellies, jams, sauces and pies[183]. Fruits can also be dried for later use[85]. Young leaves[183]. No more details are given. Flowers - raw[183]. A sweet flavour[85].

tcanta None known

dwatta Astringent Emetic OphthalmicAn infusion of the inner bark has been used as a wash for sore eyes[257]. The fruit has been eaten in quantity as an emetic[257]. It has also been used to treat diarrhoea[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between -2 to 0°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Requires a sunny position[11]. Hardy to about -20°C[200]. A very ornamental and free-flowering plant[1]. Often cultivated for its edible fruit in N. America[62]. It is disease-resistant and is being used in modern blackcurrant breeding programmes[119]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Related to *R. viscosissimum*[182].

## 5.2.487 Lilium hansonii

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hraslut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Lilium hansonii* is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Bulb - cooked[105, 177]. The bulb can be up to 7cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). Young plant - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in

the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Best grown in partial shade, the flowers are bleached in strong sunlight[143]. Lime tolerant[200]. Plants are hardy, easy to grow and long-lived, succeeding in most soils and positions[143]. Stem rooting, the bulbs should be planted 20 - 25cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[143]. A very ornamental plant[1]. The flowers have a slight but sweet perfume, this decreasing with the increase of pigment in the blooms[245]. Plants seldom produce fertile seed, even when they are hand pollinated[143]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.488 Peucedanum ostruthium

Masterwort

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hraslutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta *Peucedanum ostruthium* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentLeaves - cooked[2, 115, 177]. Used as a potherb or as a flavouring[61, 183]. The aromatic roots can be used as a flavouring[183]. They are said to taste hotter than pepper[4]. A particularly popular drink is made from the fermented roots[7].

tcanta None known

dwatta Antispasmodic Aromatic Bitter Carminative Diaphoretic Digestive Diuretic Emmenagogue Expectorant Febrifuge Homeopathy Odontalgic Skin Stimulant StomachicMasterwort is little used in modern herbalism, but it may well be a herb that bears further investigation[254]. It was held in high regard in the Middle Ages where it was especially valued for its ability to resolve all flatulence in the body and stimulate the flow of urine and menstruation[254]. It was also used in treating rheumatic conditions, shortness of breath, kidney and bladder stones, water retention and wounds[254]. The root is antispasmodic, aromatic, bitter, strongly carminative, diaphoretic, digestive, diuretic, emmenagogue, expectorant, febrifuge, stimulant and stomachic[4, 7, 9, 21, 254]. It is of use in the treatment of asthma, dyspepsia and menstrual complaints[4], an infusion helps to relieve migraine[7]. The root is gathered in the spring or autumn and dried for later use[7, 9]. An essential oil from the plant has a euphoric and odontalgic effect[7]. Used externally, it relieves skin irritation[7]. When used externally, the plant or the extracted essential oil can cause an allergic reaction to sunlight[254]. A homeopathic remedy is made from the roots[9]. No details of its applications are given[K].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta An easily grown plant, it succeeds in any moisture-retentive soil in a sunny position[200]. Dislikes shade. This report contradicts the report that this plant grows wild in woodlands. Masterwort was at one time cultivated as a pot herb and for medicinal purposes, though it has now fallen into virtual disuse[4, 200]. Suitable for group plantings in the wild garden[200].

## 5.2.489 *Lilium distichum*

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 1 m hkuc  
hmmihmtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Lilium distichum* is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Bulb - cooked[177]. The bulb can be up to 4cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). Young leaves and buds[105, 177]. No more details are given.

tcanta None known  
dwatta None known

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200] Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Grows well in open woodland, preferring a shady position[143]. Stem rooting, plant bulbs 10 - 12cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Closely allied to *L. tsingtauense*[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.490 *Lilium japonicum*

Bamboo Lily

4 tlin 8 cyuc 2 kcaok 0 tcan 2 dwat 1 m hkuc  
hmmihmtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Lilium japonicum* is a BULB growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[2, 4, 105]. It contains about 18% starch[174]. A slightly bitter taste[174]. It can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known

dwatta Antiasthmatic Antitussive Expectorant Nutritive Sedative TonicThe bulb is antiasthmatic, antitussive, expectorant, sedative and tonic (nutritive)[174, 176]. It is used in the treatment of coughs, haemoptysis, insomnia and fidgetiness in the later stage of febrile disease[176].

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months

long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Grows well in open woodland[1]. Likes plenty of moisture and some shade[42, 47]. Just to totally confuse matters, one report says that this species prefers a poor gravelly loam with plenty of leafmold and some charcoal, in a sunny position[143]. Requires protection from winter rains[143]. The sub-species *L. japonicum platyfolium* is more vigorous than the type with broader leaves. Stem rooting, the bulbs should be planted 15 - 20cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1], it is cultivated for its bulb in Japan[2] and is also a sacred flower in Japanese Shinto rites[174]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.491 *Valeriana officinalis*

Valerian, Garden valerian

4 tlin 8 cyuc 2 kcaok 3 tcan 3 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis  
hpa7tmwatli xre7t hjonli

drutta *Valeriana officinalis* is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Condiment TeaSeed[172]. No further details are given but the seeds of other members of this genus are parched and then eaten. An essential oil from the leaves and root is used as a flavouring in ice cream, baked goods, condiments etc[183]. It is especially important in apple flavours[238]. The leaves can also be used as a condiment[61]. The plant is used in moderation as a herbal tea[183].

tcanta Compost Essential Liquid feed RepellentThe plant yields about 1% of an essential oil from the roots[7, 238]. It is used in perfumery to provide a 'mossy' aroma[57, 61, 238], though the scent is considered to be disagreeable by many people[207]. The dried roots are also placed in linen cupboards and clothes drawers in order to scent the clothes[4]. The dried root attracts rats and cats, it can be used as a bait to lure them away from other areas[100]. An ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The plant can also be used to make a very good liquid plant feed[14, 18, 201]. It attracts earthworms[14, 18]. The leaves are very rich in phosphorus[201]. Dynamic accumulator.

dwatta Anticonvulsant Antispasmodic Carminative Diuretic Eczema Hypnotic Nervine Sedative StimulantValerian is a well-known and frequently used medicinal herb that has a long and proven history of efficacy. It is noted especially for its effect as a tranquilliser and nerve, particularly for those people suffering from nervous overstrain[4, 222]. Valerian has been shown to encourage sleep, improve sleep quality and reduce blood pressure[254]. It is also used internally

in the treatment of painful menstruation, cramps, hypertension, irritable bowel syndrome etc[238, 254]. It should not be prescribed for patients with liver problems[238]. Externally, it is used to treat eczema, ulcers and minor injuries[238]. The root is antispasmodic, carminative, diuretic, hypnotic, powerfully nervine, sedative and stimulant[4, 7, 9, 14, 21, 46, 147, 165, 192, 218]. The active ingredients are called valepotriates, research has confirmed that these have a calming effect on agitated people, but are also a stimulant in cases of fatigue[222]. The roots of 2 year old plants are harvested in the autumn once the leaves have died down and are used fresh or dried[4, 9, 238]. The fresh root is about 3 times as effective as roots dried at 40° (the report does not specify if this is centigrade or fahrenheit), whilst temperatures above 82° destroy the active principle in the root[240]. Use with caution[21, 238], see the notes above on toxicity.

propta Seed - sow spring in a cold frame and only just cover the seed because it requires light for germination[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant out into their permanent positions in the summer if sufficient growth has been made. If the plants are too small to plant out, grow them on in the greenhouse or frame for their first winter and plant them out early in the following summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta A very easily grown plant, it succeeds in ordinary garden soil[1], preferring a rich heavy loam in a moist site[4, 7, 17]. Thrives in full sun or in partial shade[233], doing well in light woodland. A polymorphic species, the more extreme variations are given specific status by some botanists[17]. Valerian is often grown in the herb garden and also sometimes grown commercially as a medicinal herb[1, 200]. When grown for its medicinal root, the plant should not be allowed to flower[4]. The flowers and the dried roots have a strong smell somewhat resembling stale perspiration[245]. Cats are very fond of this plant, particularly the powdered root[1, 4, 20]. Once a cat has discovered a plant they will often destroy it by constantly rolling over it[4]. The dried root also attracts rats and can be used as a bait in traps[4, 14]. A good companion for most plants. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.492 *Asclepias lanceolata*

Purple Silkweed, Fewflower milkweed

4 tlin 8 cyuc 2 kcaok 0 tcan 1 dwat 1.2 m hkuc  
hmmihmtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikwlis  
hpa7tmwatli fyixre7t hjonli

drutta *Asclepias lanceolata* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from June to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves SeedpodEdible Uses: Gum SweetenerThe following uses have been recorded for the closely related *A. rubra*. They probably also apply to this closely related species[K]. Flower buds - cooked as potherbs or added to soups[207]. Young shoots and leaves - cooked as potherbs or added to soups[207]. Young seed pods, 3 - 4 cm long, cooked[207]. Flower clusters can be boiled down to make a sugary syrup[207]. A chewing gum can be made from the latex contained in the stem and leaves, but it is possibly toxic[207].

tcanta Fibre Gum Latex StuffingThe following uses have been recorded for many other members of this genus, it is fairly safe to assume they can also be applied to this species[K]. A fibre is obtained from the bark[92, 99]. It is used in twine, coarse cloth, paper etc[92, 99]. The seed floss

is used to stuff pillows etc or is mixed with other fibres to make cloth[168, 169]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[169]. It is very water repellent. The floss has also been used to mop up oil spills at sea. Rubber can be made from latex contained in the leaves and the stems[57, 92, 112].

dwatta WartsThe latex is used as a cure for warts[168].  
propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Prefers a well-drained light rich or peaty soil and a sunny position[1, 134, 200]. A very ornamental plant[1], it is closely related to *A. rubra*[200]. This species has less flowers than most other members of the genus[235]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

## 5.2.493 *Prinsepia uniflora*

Rui Ren

4 tlin 8 cyuc 2 kcaok 0 tcan 0 dwat 1.8 m hkuc  
hmmihmtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis  
hpa7tmwatli xre7t hjonli

drutta *Prinsepia uniflora* is a deciduous Shrub growing to 1.8 m (6ft) by 3 m (9ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 105, 177]. Juicy[183]. The cherry-like fruit is about 15mm in diameter and contains one large seed[200].

tcanta None known

dwatta None known

propta Seed - best if given 2 months cold stratification[113]. Sow the seed in autumn if possible, otherwise in late winter or early spring in a cold frame in light shade. Germination may be inhibited by light[113]. Prick out the seedlings when they are large enough to handle into individual pots. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113].

nwatta Succeeds in only moderately fertile well-drained soil in full sun or light shade[200]. The plants produce flowers and fruits better when they are growing in full sun[200]. Hardy to about -20°C[184]. This species is closely allied to

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe root is sometimes used in the manufacture of gentian bitters[183]. The root contains sugar and mucilage[2] (this is probably a reference to its medicinal properties). The root was occasionally used as a flavouring in beer before the use of hops (*Humulus lupulus*) became widespread[4].

tcanta None known

dwatta Anthelmintic Antiinflammatory Antiseptic Appetizer Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Stomachic TonicGentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant and stomachic[4, 7, 9, 14, 21, 165]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root, which can be as thick as a person's arm and has few branches[239], is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Gentiana lutea* as a tonic (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species is easily grown in any good garden soil so long as it is deep enough to accommodate its roots[187, 239], though it prefers alkaline conditions[238]. It prefers full sun but succeeds in partial shade[111]. A slow-growing plant, it takes many years to reach its full stature[239]. A moisture loving plant, growing well by water, it prefers to grow with full exposure to the sun but with plenty of underground moisture in the summer and it grows better in the north and west of Britain[1]. Plants are very deep-rooted and are intolerant of root disturbance[4, 200]. They are very long lived, to 50 years or more[9]. A very ornamental plant[1], it takes about 3 years to reach flowering size from seed[4]. Cultivated as a medicinal plant in Europe[4, 57].

## 5.2.727 *Lolium temulentum*

Darnel

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta *Lolium temulentum* is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. Used as a piñole or ground into a flour and used to make bread etc[213, 257]. It is very nutritious, like oats, but it is not advisable to eat the seed due to the risk of fungal infection[114]. This fungal infection, called ergot, causes hallucinations in small doses but can cause severe damage to the nervous system in larger quantities.

tcanta None known

dwatta Anodyne SedativeThe seed is anodyne and sedative[4]. It is not actually the seed, but a fungus that is often found on the seed that has the medicinal properties[K].

propta Seed - sow spring in situ.

nwatta Succeeds in ordinary garden soil[1].

## 5.2.728 *Kalimeris incisa*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta *Kalimeris incisa* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 4. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse and only just cover. Keep the compost moist. The seed usually germinates in 2 - 3 weeks at 15°C[138]. Grow on in cool conditions, about 10°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. This should be done at least every 3 years in order to maintain the vigour of the plant.

nwatta Prefers a moist loamy soil[138] though it succeeds in most soils[1].

## 5.2.729 *Sambucus ebulus*

Dwarf Elder, Dwarf elderberry

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 1.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis  
hpa7tmwatli fyifxre7t hjonli

drutta *Sambucus ebulus* is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - cooked. It is used as a flavouring in soups etc[177]. The fruit is about 6mm in diameter and is borne in large clusters[200]. Some caution is advised, see the notes above on

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[2, 4, 94, 161]. The root was a staple food of some native North American Indian tribes[257]. It is said to be extremely nutritious, 50 - 80 grams being sufficient to sustain an active person for a day[4, 207]. The root is, however, rather small and tedious to collect in quantity[207]. It is easiest to use when the plant is in flower in the spring, because the outer layer of the root (which is very bitter) slips off easily at this time of the year[85, 95]. Whilst being boiled the roots become soft and swollen and exude a pink mucilaginous substance[183]. The root swells to about 6 times its size and resembles a jelly-like substance[105]. The root has a good taste though a decided bitter flavour develops afterwards[85]. If the root is stored for a year or two the bitterness is somewhat reduced[183]. The root can also be dried, ground into a powder and used as a mush or a thickener in soups etc[212, 257].

tcanta None known

dwatta Blood purifier Cardiac Galactogogue PoulitceThe root is cardiac and galactogogue[257]. An infusion of the root has been used to increase the milk flow in nursing mothers, to relieve heart pain and the pain of pleurisy and also as a blood purifier[257]. The root has been eaten raw to counteract the effects of poison ivy rash and as a treatment for diabetes[257]. The pounded dry root has been chewed in the treatment of sore throats[257]. A poultice of the raw roots has been applied to sores[257].

propta Seed - best sown as soon as it is ripe in a cold frame in a very freely draining soil[129]. Sow stored seed as soon as possible in a cold frame. One month cold stratification should improve germination, though this is still likely to be very slow. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first two winters. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March/April. Very difficult.

nwatta Requires a very well-drained gritty humus-rich deep soil in a sunny position[1, 200]. This species is not reliably hardy in Britain. It can withstand consistently very cold weather but does not like alternating periods of mild and cold conditions, nor does it like winter wet[1]. The plant is very susceptible to rotting at the neck in a damp soil[200]. The plant is easy to kill by over-watering but extremely difficult to kill by under-watering. Roots that have been dried and stored for a number of years have been known to come back into growth when moistened[95]. The plant dies down after flowering and re-appears in September. It must be kept dry whilst dormant[129]. It is best grown in a greenhouse or bulb frame[200]. A very ornamental plant[1], it is the state flower of Montana[85, 95]. Very apt to hybridize with other members of this genus[1].

## 5.2.571 *Taraxacum obovatum*

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli fyifxre7t hjonli

drutta *Taraxacum obovatum* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Coffee TeaLeaves - raw or cooked. They have a mild flavour[217]. The following uses are also probably applicable to this species, though we have no records for them[K] Root - cooked[183]. Flowers - raw or cooked[183]. The unopened flower buds can be used in fritters[183]. The whole plant is dried and used as a tea[177, 183]. A pleasant tea is made from the flowers. The leaves and the roots can also be used to make tea. The root is dried and roasted to make a coffee substitute.

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame and either surface-sow or only just cover the seed. Make sure the compost does not dry out. Germination should take place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle, choosing relatively deep pots to accommodate the tap root. Plant them out in early summer. Division in early spring as the plant comes into growth.

nwatta Prefers a well-drained humus-rich soil in full sun or light shade. According to one report this species reproduces apomictically and sexually[50], whilst another report says that only apomictic seed production is undergone[110]. Apomixis is an asexual method of seed production where each seed is genetically identical to the parent plant. Occasionally seed is produced sexually, the resulting seedlings are somewhat different to the parent plants and if these plants are sufficiently distinct from the parents and then produce apomictic seedlings these seedlings are, in theory at least, a new species.

## 5.2.572 *Orchis italica*

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwisslip  
hpa7tmwatli xre7t hjonli

drutta *Orchis italica* is a BULB growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from October to June, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: DrinkRoot - cooked[2, 4, 46]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Antidiarrhoeal Antiflatulent Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots

still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Requires a deep rich soil[1]. Best grown in a sunny position in a well-drained bank and a loamy soil[42]. Plants are fairly hardy in Britain but, because they come into growth in the winter, they are best cultivated in a frame or cold greenhouse[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Plants seem to be immune to the predations of rabbits[233]. Cultivated plants are very susceptible to the predation of slugs and snails[230].

### 5.2.573 Blephilia hirsuta

Hairy wood-mint or hairy pagoda plant

4 tlin 7 cyuc 2 kcak 2 tcan 0 dwat 0.7 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Blephilia hirsuta is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The flowers are pollinated by Bees, Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves. Minty leaves eaten raw and used in teas. The fresh or dried leaves are used for tea [1-4].

tcanta A strong scented plant that may act as an aromatic pest confuser reducing their ability to find other nearby crops [1-3]. A good plant for food forests, wild, native plant or open woodland gardens.

dwatta None Known

propta Propagate by division or by Seed

nwatta An herbaceous perennial of the mint family. Hairy wood mint prefers rich moist to mesic soil in hardwood forests, along streams and rivers, in forest openings and thickets underlain by limestone, and is occasionally found near wetlands. A rich loamy soil with decaying leaf mold is ideal. It likes partial sun or light shade. Forests with infrequent, low-intensity disturbances (i.e., gap dynamics) are ideal. This species also grows in soil that is somewhat rocky. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Fibrous shallow roots. Bloom Time: May to September (Northern Hemisphere). Flower are Showy and the leaf is fragrant.

### 5.2.574 Hypochoeris radicata

Cat’s Ear

4 tlin 8 cyuc 2 kcak 0 tcan 1 dwat 0.3 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hypochoeris radicata is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies lepidoptera. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH:

mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked like spinach[5, 52, 53, 183]. A winter salad[100], it is rather bitter[K]. Young leaves are mild and agreeable[217].

tcanta None known

dwatta PectoralPectoral[100].

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can be sown outdoors in situ in the spring.

nwatta Requires a well-drained soil and a sunny position or light shade. Another report says that it dislikes shade. A common lawn weed[24].

### 5.2.575 Erythronium tuolumnense

Tuolumne Fawn Lily, Dog’s Tooth Violet, Pagoda Lily

4 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erythronium tuolumnense is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a medium rate. It is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Although no specific mention has been found for this species, most if not all members of the genus provide edible bulbs[K]. The ovoid bulb is 5 - 10cm long[270].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer, it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Landscape Uses:Alpine garden, Container, Rock garden, Woodland garden. Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Plants are hardy to at least -15°c[200]. Plants are spreading well, but only flowering lightly in the dappled shade of a woodland garden at Kew[K]. Bulbs should be planted about 7cm deep[1]. They increase rapidly by offsets[188]. Special Features: Attractive foliage, North American native, Naturalizing.

### 5.2.576 Petasites albus

Butterbur

4 tlin 8 cyuc 2 kcak 0 tcan 1 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyikprik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Petasites albus is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen in May. The species is dioecious (individual flowers are either male or female, but only one

their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Very tolerant of maritime exposure[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.723 Cimicifuga simplex

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cimicifuga simplex is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentLeaves - cooked[105, 177, 183]. Some caution is advised, see the notes above on toxicity. The fragrant root is used as a spice[183].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Only just cover the seed. It germinates in 1 - 12 months or even longer at 15°c[164]. The seed does not store well and soon loses its viability[200], stored seed may germinate better if given 6 - 8 weeks warm stratification at 15°c and then 8 weeks cold stratification[164]. Prick out the young seedlings into individual pots when they are large enough to handle and grow them on in a frame for their first winter. Plant out in late spring or early summer[K]. Division in spring or autumn[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist humus rich soil and some shade[1, 200]. Succeeds in ordinary garden soil[1]. Grows well in the dappled shade of woodland[88]. Plants are hardy to at least -25°c[187]. A number of named varieties have been selected for their ornamental value[187]. A good bee and butterfly plant[88]. The flowers have an unusual, slightly unpleasant smell[188]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.724 Elsholtzia fruticosa

Ji Gu Chai

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Elsholtzia fruticosa is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: Condiment OilThe powdered seeds are used as a condiment for flavouring food-stuffs[272]. An edible oil is obtained from the seed[272].

tcanta Incense Miscellany Oil Pot-pourriThe highly aromatic foliage is used in pot-pourri[200]. The powdered plant is used for incense[272].

dwatta Anodyne MiscellanyOne report says that the plant is used medicinally, but gives no more informa-

tion[266]. The juice of the roots is used to relieve headaches[272].

propta Seed - sow spring in a greenhouse or cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Grows well on woodland margins[200]. This species is a sub-shrub, the woody stems often dying back to the base in severe winters[200].

### 5.2.725 Ribes fasciculatum

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Ribes fasciculatum is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from March to November, in flower in April, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[177]. Unpalatable[1]. The reddish-brown fruit is about 5 - 10mm in diameter and contains a lot of fairly large seeds[266]. What little flesh there is remains unpleasant even in the autumn[K]. The fruit hangs well, probably because it is unpalatable[K]. Young leaves - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°c and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year’s growth, preferably with a heel of the previous year’s growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°c[200]. The flowers have a delicious aromatic perfume[245]. The fruit can hang on the plant until winter[182]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Female flowers appear to be perfect but the pollen in them and the ovules in the male flowers are sterile[11]. Plants are therefore functionally dioecious, male and female plants must be grown if fruit and seed is required.

### 5.2.726 Gentiana lutea

Yellow Gentian

4 tlin 8 cyuc 1 kcak 0 tcan 5 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gentiana lutea is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

til they are well established before planting them out in late spring or early summer.

nwatta Easily grown in ordinary garden soil so long as it is not too dry[1]. Requires a moist soil and a sunny position[1, 200]. Likes some shade. A good bee plant. Plants are subject to mildew in dry summers[200].

## 5.2.720 Iris germanica

Purple Flag, German iris, Orris-root, Tall Bearded German Iris, Bearded Iris

4 tlin 10 cyuc 1 kcaak 0 tcan 3 dwat 1 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikhwisslip hpa7tmwatli fyfjkre7t hjonli

drutta Iris germanica is a PERENNIAL growing to 1 m (3ft 3in) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe root is dried and used as a flavouring[105, 183].

tcanta Baby care Beads Cosmetic Dye EssentialThe root is a source of Orris powder which has the scent of violets[238]. It is obtained by grinding up the dried root[4, 7, 46]. It is much used as a fixative in perfumery and pot-pourri, as an ingredient of toothpastes, breath fresheners etc and as a food flavouring. The root can take several years of drying to fully develop its fragrance, when fresh they have an acrid flavour and almost no smell[4, 168]. An essential oil is obtained from the fresh root, this has the same uses as the root[57, 61]. The juice of the root is sometimes used as a cosmetic and also for the removal of freckles from the skin[4]. A black dye is obtained from the root[168]. A blue dye is obtained from the flowers[168]. The seeds are used as rosary beads[61].

dwatta Diuretic Emetic Expectorant PurgativeThe root is diuretic, emetic, expectorant and mildly purgative[7, 9, 61]. Another report says that the juice of the fresh root is a strong purge of great efficiency in the treatment of dropsy[4]. In the past, sections of the dried root have been given to teething babies to chew on, though this has been discontinued for hygienic reasons[9]. Roots of plants 2 - 3 years old are dug up after flowering and are then dried for later use[7].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. A sterile plant, it does not produce seed[233]. Division, best done after flowering. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Massing, Rock garden, Specimen. A very easily grown plant that tolerates considerable neglect[233], it prefers a sunny position in a well-drained soil that contains some lime[1, 79]. Grows well in dry soils in light deciduous shade[187]. Succeeds in full sun or partial shade[79]. Prefers a pH in the range 6 to 7.5 or higher[200]. Many named varieties have been selected for their ornamental value[187]. The plant is also sometimes cultivated for the essential oil in its root[9]. The plant is sterile and does not produce seed[233]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features:Not North American native, All or parts of this plant are poisonous, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

## 5.2.721 Lycopus europaeus

Gypswort

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 1 m hkuc hmimhtut cyutli tucphja7nhs6s hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli fyfjkre7t hjonli

drutta Lycopus europaeus is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite

(has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcaakta Edible Parts: RootEdible Uses: Root - raw or cooked. A famine food, it is only used when all else fails[179].

tcanta Dye MiscellanyA black dye is obtained from the plant[4, 100]. It is said to give a permanent colour and was also used by gypsies in order to darken the skin[4].

dwatta Astringent Miscellany Poultice SedativeThe fresh or dried flowering herb is astringent and sedative[4]. It inhibits iodine conversion in the thyroid gland and is used in the treatment of hyperthyroidism and related disorders[9]. The whole plant is used as an astringent, hypoglycaemic, mild narcotic and mild sedative[4, 238]. It also slows and strengthens heart contractions[238]. The plant has been shown to be of value in the treatment of hyperthyroidism[9, 238], it is also used in the treatment of coughs, bleeding from the lungs and consumption, excessive menstruation etc[4, 238]. The leaves are applied as a poultice to cleanse foul wounds[240]. This remedy should not be prescribed for pregnant women or patients with hypothyroidism[238]. The plant is harvested as flowering begins and can be used fresh or dried, in an infusion or as a tincture[4, 238]. Current uses are predominantly for increased activity of the thyroid gland and for premenstrual syndrome symptoms such as breast pain [301]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Lycopus* for nervousness and premenstrual syndrome (see [302] for critics of commission E).

propta Seed - sow spring or autumn in a cold frame[238]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring or autumn[238]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Tolerates most soil types so long as they are wet. Grows well in shallow water. Succeeds in sun or shade.

## 5.2.722 Salix brachycarpa

shortfruit willow

4 tlin 8 cyuc 1 kcaak 3 tcan 2 dwat 1.4 m hkuc htut cyutli tucphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix brachycarpa is a deciduous Shrub growing to 1.4 m (4ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - not very palatable[172].

tcanta ShelterbeltA salt tolerant coastal plant, it can be grown as part of a shelterbelt[200]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into

sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: StemEdible Uses: The small fleshy petioles (leaf stems) are very palatable when cooked and eaten like asparagus[7].

tcanta A good ground cover for the wilder areas of the garden[200]. It is too invasive to be used in small gardens and is only suitable for covering large areas[208]. The leaves were at one time used by peasants as a head covering[7].

dwatta Antitussive Emmenagogue Homeopathy Hypnotic Sedative VulneryThe root is emmenagogue, hypnotic, sedative and vulnerary[7, 172]. The ground or finely chopped rhizome has a healing effect when applied to slow-healing or weak ulcers, or to suppurating wounds[7]. An infusion of the leaves is a specific remedy for coughs[7]. A homeopathic remedy is made from the roots[7]. It is used in the treatment of wounds, ulcers etc[7].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Prefers partial shade[31]. Prefers a heavy soil[208]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Dioecious, male and female plants must be grown if seed is required.

## 5.2.577 Potentilla egedei

Pacific Silverweed

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tucp hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli fyfjkre7t hjonli

drutta Potentilla egedei is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: RootEdible Uses: Root - raw or cooked[118, 172, 257]. The raw root has a bitter flavour but most of the bitterness is lost once the root is cooked and the flavour then becomes somewhat like a sweet potato[256]. The roots are rather thin but were a staple food of some North American Indian tribes[256].

tcanta None known

dwatta Astringent Ophthalmic PoulticeThe whole plant is astringent[172]. A poultice of the boiled roots and oil can be applied to sores and swellings[257]. The juice from the roots has been used as a wash for sore eyes[257].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. This species is closely related to *P. anserina*[43, 200].

## 5.2.578 Cardamine pennsylvanica

Bittercress

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli fyfjkre7t hjonli

drutta Cardamine pennsylvanica is a BIENNIAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: CondimentLeaves - raw or cooked[46, 61, 159, 171]. An excellent water cress substitute[105]. A slightly bitter flavour, but not disagreeable[207]. The grated raw root is used as a condiment[207].

tcanta None known

dwatta Carminative DigestiveThe leaves and the flowering plant are carminative and digestive[172].

propta Seed - sow outdoors in a seedbed in a shady position in April. Plant out in autumn or spring. Division.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. A polymorphic species[43], it is closely related to *C. parviflora*[274]. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

## 5.2.579 Uvularia sessilifolia

Bellwort, Sessileleaf bellwort

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc pcimhmim cyutli tucp hwicli hrasjlut hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Uvularia sessilifolia is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[2, 61, 105, 161, 257]. The shoots are harvested when they are still tender enough to be broken off with a fingernail and are used as an asparagus substitute[46, 183]. Root - cooked[22, 46, 61, 105, 183] or used in diet drinks[183, 207].

tcanta None known

dwatta Blood tonic PoulticeA tea made from the roots is a blood purifier and is used in the treatment of diarrhoea[222, 257]. It is taken internally to aid in healing broken bones[222]. A poultice of the roots is applied to broken bones, boils etc[222, 257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division after the plants die down in late summer. It is best carried out in early spring before the plants flower[188]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light

shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Requires a cool moist shady position and a light sandy soil[1, 42, 111]. Likes plenty of humus in the soil[111]. Grows well in a deciduous woodland garden[42, 200] and in the rock garden[200]. Plants grow much taller in rich soils and then succeed in the herbaceous border[222]. They can spread quite quickly when in a suitable position[233]. A very hardy plant, tolerating temperatures down to about -20°c[187]. This species is closely related to *U. caroliniana*[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.580 Clintonia umbellulata

Speckled Wood Lily, White clintonia  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Clintonia umbellulata is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[61, 105, 177]. Harvested in spring before they fully unfurl, they have a cucumber flavour[62]. Older leaves can be cooked[62].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the spring[200]. Stored seed should be sown in late winter or early spring in a cold frame[164]. It sometimes germinates within 1 - 3 months at 15°c, but may take a year. The seed should be completely separated from the fruit and should only just be covered by soil[164, 200]. If the seed has been sown thinly enough, then it is possible to leave the seedlings in the pot for their first growing season, dividing them after they become dormant. Make sure to give them liquid feeds at intervals through the spring and summer. Otherwise prick out the seedlings into individual pots when they are large enough to handle. Plant out in late spring or early summer at the beginning of their second or third years growth. Division in spring as new growth is just commencing[200].

nwatta Prefers a damp peaty sandy soil in a cool damp shady position[1, 42, 200]. Requires a moist neutral to acid soil[200]. Succeeds in acid clay soils[187]. Dormant plants are hardy to at least -25°c, but the new growth in spring can be damaged by late frosts[187]. Plants only produce their fruit in warm seasons in Britain[200]. They have shortly-creeping underground stems and form dense patches[187].

## 5.2.581 Codonopsis ovata

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Codonopsis ovata is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. It can be dried and ground into a powder[105]. A famine food, used when all else fails[145].

tcanta None known

dwatta PoulitceThe roots and leaves are used to make a poultice for the treatment of bruises, ulcers and wounds[211, 240].

propta Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to avoid the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

nwatta Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. Plants only succeed in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Dormant plants are hardy to about -20°c, but this species is not easy to grow in cultivation[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species is not as cold tolerant as most members of the genus, it is best given a good mulch in the winter[200]. The plant resents root disturbance and should be planted out into its permanent position as soon as possible[164]. It is best grown on a high bank in order to give a good view of the flowers[1]. The flowers, when inhaled near to, have the unpleasant odour of fur - likened by some to the smell of ferrets[245]. Plants are very susceptible to the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K].

## 5.2.582 Cirsium arvense

Creeping Thistle, Canada thistle  
4 tin 7 cyuc 2 kcaak 2 tcan 2 dwat 0.9 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Cirsium arvense is a PERENNIAL growing to 0.9 m (3ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil Root StemEdible Uses: Curdling agent OilRoot of first year plants - raw or cooked[183]. Nutritious but rather bland, they are best used in a mixture with other vegetables[9]. The root is likely to be rich in inulin, a starch that cannot be digested by humans. This starch thus passes straight through the digestive system and, in some people, ferments to produce flatulence[K]. Stems - they are peeled and cooked like asparagus or rhubarb[9, 12, 177, 183]. Leaves - raw or cooked[177, 183]. A fairly bland flavour, but the prickles need to be removed before the leaves can be eaten - not only is this rather fiddly but very little edible leaf remains[K]. The leaves are also used to coagulate plant milks etc[46, 61, 183].

tcanta Oil TinderThe seed fluff is used as a tinder[106]. The seed of all species of thistles yields a good oil by expression[4]. The seed of this species contains about 22% oil[240]. Dynamic accumulator.

dwatta Antiphlogistic Astringent Diuretic Emetic Emmenagogue Hepatic TonicThe root is tonic, diuretic, astringent, antiphlogistic and hepatic[207]. It has been chewed as a remedy for toothache[4]. A decoction of the roots has been used to treat worms in children[257]. A paste of the roots, combined with an equal quantity of the root paste of *Amaranthus spinosus*, is used in the treatment of indigestion[272]. The plant contains a volatile alkaloid and a glycoside called cynin, which has emetic and emmenagogue properties[240].

the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Leaves - cooked[105]. Some caution is advised, see the notes above on toxicity.

tcanta Both the growing and the dried plant can be used to repel bugs and fleas[211].

dwatta Black cohosh is a traditional remedy of the North American Indians where it was used mainly to treat women's problems, especially painful periods and problems associated with the menopause[254]. A popular and widely used herbal remedy, it is effective in the treatment of a range of diseases[4]. The root is alternative, antidote, antirheumatic, antispasmodic, astringent, cardiotoxic, diaphoretic, diuretic, emmenagogue, expectorant, hypnotic, sedative, tonic and vasodilator[4, 7, 21, 46, 57, 165, 192, 222]. It is harvested in the autumn as the leaves die down, then cut into pieces and dried[4]. The root is toxic in overdose, it should be used with caution and be completely avoided by pregnant women[222]. See also the notes above on toxicity. The medicinally active ingredients are not soluble in water so a tincture of the root is normally used[222]. It is used in the treatment of rheumatism, as a sedative and an emmenagogue[213]. It is traditionally important in the treatment of women's complaints, acting specifically on the uterus it eases uterine cramps and has been used to help in childbirth[222, 268]. Research has shown that the root has oestrogenic activity and is thought to reduce levels of pituitary luteinizing hormone, thereby decreasing the ovaries production of progesterone[222, 254]. The root is also hypoglycaemic, sedative and anti-inflammatory[222]. Used in conjunction with St. John's Wort (*Hypericum perforatum*) it is 78% effective in treating hot flushes and other menopausal problems[254]. An extract of the root has been shown to strengthen the male reproductive organ in rats[222]. The root contains salicylic acid, which makes it of value in the treatment of various rheumatic problems - it is particularly effective in the acute stage of rheumatoid arthritis, sciatica and chorea[268]. Its sedative action makes it useful for treating a range of other complaints including tinnitus and high blood pressure[254]. The roots are used to make a homeopathic remedy[232]. This is used mainly for women, especially during pregnancy[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Cimicifuga racemosa* (*Actaea racemosa*) for climacteric (menopause) complaints, Premenstrual syndrome. (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Only just cover the seed. It germinates in 1 - 12 weeks or even longer at 15°c[164]. The seed does not store well and soon loses its viability[200], stored seed may germinate better if given 6 - 8 weeks warm stratification at 15°c and then 8 weeks cold stratification[164]. Prick out the young seedlings into individual pots when they are large enough to handle and grow them on in a frame for their first winter. Plant out in late spring or early summer[K]. Division in spring or autumn[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them out in a cold frame until they are rooting well. Plant them on in the summer or following spring.

nwatta Landscape Uses:Border, Container, Woodland garden. Prefers a moist humus rich soil and some shade[1, 111, 200]. Grows well in dappled shade[28, 31, 88]. Succeeds in ordinary garden soil[1] and tolerates drier soils[233]. Plants are hardy to at least -20°c[187]. A very ornamental species[233]. The flowers have an unusual, slightly unpleasant smell[188] which is thought to repel insects[213]. Plants grow and flower well in Britain, though they seldom if ever ripen their seed[4]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features:Attractive foliage, North American native, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

## 5.2.718 Sanguisorba canadensis

American Great Burnet, Canadian burnet  
4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.2 m hkuc

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Sanguisorba canadensis is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft 1in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - boiled, washed in water to remove the bitterness and then eaten with salt and miso[177, 183].

tcanta None known  
dwatta None known

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the spring[188].

nwatta Succeeds in ordinary garden soil[1]. Prefers a good moist soil that does not dry out in the summer, in sun or partial shade[187, 200]. Succeeds in the flower border or in moist grass[1], plants can become invasive when they are grown by water[200]. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°c). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.719 Monarda clinopodia

White Basil-Balm, White bergamot  
4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Monarda clinopodia is a PERENNIAL growing to 1.3 m (4ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe fresh or dried leaves and flower heads are brewed into a tea. Said to be excellent when mixed with other teas[183].

tcanta None known  
dwatta None known

propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°c. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame un-



## 5.2.714 *Rumex obtusifolius*

Round-Leaved Dock, Bitter dock

4 tlin 8 cyuc 1 ckak 3 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta *Rumex obtusifolius* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Leaves Seed StemEdible Uses: Young leaves - cooked[8, 22, 46, 61]. A bitter taste, especially if the older leaves are used[105, 183]. The leaves are usually cooked in at least one change of water in order to reduce the bitterness[183]. Leaves can also be dried for later use[12]. The leaves have a much milder flavour when they are first produced in early spring[K]. Young stems - cooked[257]. Seed - raw or cooked[102, 172]. The seed can also be ground into a powder and used to make a gruel or added to cereal flours when making bread etc[102]. It is rather small and fiddly to harvest.

tcanta DyeYellow, dark green to brown and dark grey dyes can be obtained from the roots of this plant[14, 168]. They do not need a mordant[168].

dwatta Astringent Blood purifier Contraceptive SalveThe leaves are often applied externally as a rustic remedy in the treatment of blisters, burns and scalds[4, 14]. The root contains tannin and is astringent and blood purifier[257]. A tea made from the roots has been used in the treatment of jaundice, whooping cough, boils and bleeding[4, 257]. An infusion of the root has been used as a wash, especially for children, to treat skin eruptions[257]. One report says that the root has been used as a contraceptive to stop menstruation[257]. The root is harvested in early spring and dried for later use[4].

propta Seed - sow spring in situ. Division in spring.

nwatta Requires a good soil[4]. Plants are occasionally cultivated for their edible leaves[61]. A very important food plant for the caterpillars of many species of butterfly[30]. This species is an alternative host of the turnip fly[4].

## 5.2.715 *Pycnanthemum flexuosum*

Mountain Mint, Appalachian mountainmint

4 tlin 8 cyuc 1 ckak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Pycnanthemum flexuosum* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta One report says that the plant is used for food, but gives no details[257].

tcanta None known

dwatta Analgesic Diaphoretic Febrifuge StomachicThe leaves and flowering stems are popularly used in the treatment of bowel complaints[207]. A hot infusion of the plant is diaphoretic[207]. The plant is also used internally in the treatment of stomach upsets, fevers, colds and sinus headaches[238, 257]. A poultice of the leaves is used in the treatment of headaches[257]. A warm infusion of the plant has been used to bathe an inflamed penis[257]. The plant is harvested as it comes into flower and can be used fresh or dried.

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If there are sufficient seeds they can be sown in an outdoor seedbed in April. Division in spring.

nwatta Succeeds in most soils[1] but prefers a rich loamy soil in full sun or partial shade with plenty of moisture in the growing season[200]. Hardy to at least -15°C[200]. The correct name for this species should be *P. tenuifolium*. Schrad.[228]. The bruised leaves are very aromatic[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.716 *Lysimachia vulgaris*

Yellow Loosestripe, Garden yellow loosestripe

4 tlin 8 cyuc 1 ckak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Lysimachia vulgaris* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

ckakta Edible Parts: LeavesEdible Uses: Young leaves[105, 177]. No more details are given.

tcanta DyeA yellow dye is obtained from the flowers[13, 100]. A brown dye is obtained from the rhizomes[13]. The growing plant repels gnats and flies, it has been burnt in houses in order to remove these insects[4].

dwatta Antidiarrhoeal Astringent Demulcent Dysentery ExpectorantAn astringent herb, yellow loosestripe is principally used to treat gastro-intestinal conditions such as diarrhoea and dysentery, to stop internal and external bleeding and to cleanse wounds[254]. The herb is astringent, demulcent and expectorant[4, 61]. It is harvested when in flower in July and dried for later use[4]. The plant can be used internally or externally and is useful in checking bleeding of the mouth, nose and wounds, restraining profuse haemorrhages of any kind and in the treatment of diarrhoea[4]. It makes a serviceable mouthwash for treating sore gums and mouth ulcers[254].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings, March to April in a cold frame. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, succeeding in a moist or wet loamy soil in sun or partial shade[187]. Prefers a shady position[111]. Grows well in heavy clay soils. Hardy to at least -25°C[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. A very ornamental plant[1]. The sub-species *L. vulgaris davurica*. (Ledeb.)Kunth. is the form used for food in China and Japan[177].

## 5.2.717 *Cimicifuga racemosa* (*Actaea racemosa*)

Black Cohosh, Black Snakeroot, Bugbane

4 tlin 10 cyuc 1 ckak 0 tcan 4 dwat 1.5 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Cimicifuga racemosa* (*Actaea racemosa*) is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to October, and

The leaves are antiphlogistic[207]. They cause inflammation and have irritating properties[207].

propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°C. A pernicious weed, not many people would want to invite this plant into their garden.

nwatta The creeping thistle is a pernicious garden weed, spreading freely from its aggressive root system[17, K], It can quickly form dense clumps of growth and really does not need to be introduced into the garden. Succeeds in any ordinary garden soil in a sunny position[200]. Plants are often dioecious[17]. A polymorphic species[17]. Special Features:North American native, Invasive, Attracts butterflies. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.583 *Osmunda cinnamomea*

Cinnamon Fern

4 tlin 8 cyuc 2 ckak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta *Osmunda cinnamomea* is a FERN growing to 0.6 m (2ft) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta Edible Parts: LeavesEdible Uses: The young un-expanded fronds are eaten as a nibble or cooked in soups[46, 61, 62, 116, 159, 183, 257]. The taste is said to resemble asparagus[200]. The young shoots are seen as a 'spring tonic' to cleanse the body with fresh green food after a long winter eating mainly stored foods[257]. The latent buds can be eaten in early spring, they rival chestnuts in size and flavour[95].

tcanta None known

dwatta Analgesic Antirheumatic GalactogogueA decoction of the root has been rubbed into affected joints as a treatment for rheumatism[257]. The root has been chewed, a small portion swallowed and the remainder applied to a snakebite[257]. The following reports do not state which part of the plant is being used, though it is most likely that the root is being referred to. The plant is analgesic, antirheumatic and galactogogue[257]. A decoction is used internally in the treatment of headaches, joint pain, rheumatism, colds etc, and also to promote the flow of milk in a nursing mother[257].

propta Spores - they very quickly lose their viability (within 3 days) and are best sown as soon as they are ripe on the surface of a humus-rich sterilized soil in a lightly shaded place in a greenhouse. Keep the compost moist, preferably by putting a plastic bag over the pot. Plants develop very rapidly, pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Cultivars usually come true to type[200]. Division of the rootstock in the dormant season. This is a very strenuous exercise due to the mass of wry roots[200].

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden, Specimen, Woodland garden. Easily grown in a damp woodland or by the margins of pools and streams[187]. Likes a soil of swamp mud and loamy or fibrous peat, sand and loam[1]. Succeeds in most moist soils, preferring acid conditions[200]. Requires a constant supply of water, doing well by ponds, streams etc[1]. Plants thrive in full sun so long as there is no shortage of moisture in the soil and also in shady situations beneath shrubs etc[200]. Requires a shady position[188]. Plants are hardy to at least -20°C, they are evergreen in warm winter areas but deciduous elsewhere[200]. This species is sometimes cultivated for its edible fronds[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1]. The rhizome is large and slowly creeping[187]. Special Features:Attractive foliage, North American native, Naturalizing, Wetlands plant, There are no flowers or blooms.

## 5.2.584 *Pachysandra terminalis*

Japanese Spurge, Japanese pachysandra, Pachysandra

4 tlin 8 cyuc 2 ckak 0 tcan 0 dwat 0.2 m hkuc pcmhimm cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli frusflatprikliwsslip hpa7tmwatli hjonli

drutta *Pachysandra terminalis* is an evergreen Shrub growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Sweet and juicy[105]. The ovoid fruits are 5 - 6mm long[266]. The fruit is not usually produced in cultivation[200] - this could be because both male and female plants are required and most people only grow one plant.

tcanta A very useful ground cover plant for a shady position, spreading by means of underground runners[182, 190]. A vigorous grower, but it is not too invasive[200].It grows well in the shade of shrubs[K].

dwatta None known

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise sow it in late winter. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse or cold frame. Plant out in early summer of the following year. Cuttings of half-ripe wood, 4 - 7cm long taken at a node, June - August in a shady position in a frame[78]. Division in spring[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer[K].

nwatta Landscape Uses:Border, Container, Erosion control, Ground cover, Rock garden, Woodland garden. A very tolerant plant, it thrives in any moist well-drained soil[11, 200]. Easily grown in a loose leafy soil succeeding in dry shade[187] and tolerating drought once it is established[190]. Grows well under trees[11]. Dislikes dry soils, full sun and strong winds[200]. Prefers a lime-free soil[182] according to one report whilst another says that it succeeds in acid and alkaline soils[200]. Hardy to about -25°C[187]. Plants are monoecious and rarely if ever produce fruit in cultivation[187, 200]. The flowers have a pleasant sweet fragrance[245]. At least one named form has been selected for its ornamental value[187]. Special Features: Attractive foliage, Not North American native, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms.

## 5.2.585 *Hierochloe odorata*

Holy Grass

4 tlin 8 cyuc 2 ckak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli kyuctcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Hierochloe odorata* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

ckakta Edible Parts: SeedEdible Uses: Colouring CondimentSeed - cooked[105]. Small and fiddly to use. It almost certainly does not contain coumarin and should be safe to use. An essential oil from the leaves is used as a food flavouring in sweets and soft drinks. It has a strong vanilla-like flavour[183]. The leaves are added to vodka as a flavouring[238]. The plant is said to be used as a colouring agent[183] but no more details are given.

tcanta Basketry Hair Incense Repellent Soil stabilization Strewing StuffingThe dried leaves are used as an incense[46, 61, 99], they were formerly also used as a strewing herb[1, 46, 238] and have been used as a stuffing in pillows and mattresses[257]. They have also been used as an insect repellent in the clothes cupboard where they impart a nice smell to the clothes[99, 238]. The leaves are used to make aromatic baskets[46, 61, 99, 169, 171]. The wet leaves can be sewn together, dried until they are tight and then resin used over the stitches to make a waterproof container[257]. The leaves can be soaked in water to make a tonic hair wash[257]. An essential oil distilled from the leaves is used in perfumery where it acts as an excitant and fixative for other aromas[238]. The plant has a very aggressive root system and has been planted to stabilize banks[74].

dwatta Birthing aid Febrifuge Skin VEDA tea made from the leaves is used in the treatment of fevers, coughs, sore throats, chafing and venereal infections[222, 257]. It is also used to stop vaginal bleeding and to expel afterbirth[222]. The stems can be soaked in water and used to treat wind-burn and chapping and as an eyewash[257]. Some caution is advised when using this plant internally, see the notes above on toxicity[222]. The leaves are harvested in the summer and dried for later use[238]. Smoke from the burning leaves has been inhaled in the treatment of colds[257].

propta Seed - sow spring in situ and only just cover the seed[162]. Germination usually takes place within 2 weeks. If the seed is in short supply it can be sown in the cold frame in the spring. When large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. Division in spring or summer[162]. Very simple, virtually any part of the root will regrow to make a new plant[K].

nwatta Prefers a damp position in a rich soil but succeeds in most soils including quite dry conditions[162]. Grows best in a sunny position[238]. The plants have a running root system and can spread aggressively when grown in suitable conditions[74]. The plant, as it dries, emits a powerful scent of newly mown hay[245].

### 5.2.586 Jovibarba sobolifera

Hen And Chickens Houseleek

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc htut cyutli kyuctcup hwicli hras hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Jovibarba sobolifera is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaf rosettes and young shoots - raw[74].

tcanta None known

dwatta None known

propta Seed - we have no details for this species but suggest surface sowing the seed in a sunny position in a greenhouse in late winter or early spring. Do not allow the compost to become dry. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of offsets in the summer[200].

nwatta Succeeds in any sandy soil[1]. Requires a gritty well-drained soil in full sun[200]. Succeeds on a wall[188]. Plants are hardy to about -15°c[200] so long as they are in a well-drained soil. They strongly dislike winter wet[200]. Individual offsets take several years to reach flowering size but then die after flowering, though more offsets are produced[188, 200]. This species does not hybridize naturally[1].

### 5.2.587 Trillium erectum

Beth Root - Indian Balm, Red trillium, Wakerobin, Purple Trillium

4 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 0.4 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Trillium erectum is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked. Used in spring[207], the young unfolding leaves are an excellent addition to the salad bowl, tasting somewhat like sunflower seeds[183]. Leaves can also be cooked as a potherb[183].

tcanta None known

dwatta Antiseptic Aphrodisiac Astringent Birthing aid Expectorant Poultice Tonic Urinary Uterine tonicBeth root was traditionally used by various native North American Indian tribes as a woman’s herb to aid childbirth, as a treatment for irregular menstrual periods, period pains and excessive vaginal discharge[254]. Modern research has shown that the root contains steroidal saponins, which have hormonal effects on the body[222, 238]. These saponins are being used in gynaecological and obstetric medicine[238]. This herb should not be taken during pregnancy except under professional supervision[254]. The root is antiseptic, aphrodisiac, astringent, expectorant, tonic, uterine tonic[4, 46, 61, 165, 222, 238]. It is used internally in the treatment of a wide range of women’s complaints including haemorrhage from the uterus, urinary tract and lungs, and also to curb excessive menstruation[238]. It has proved to be of value in stopping bleeding after parturition[244]. Externally, it is used to treat excessive vaginal discharge, ulcers (especially varicose), skin complaints, gangrene, insect bites and stings[238, 244]. It is also used as a wash for sore nipples[244]. The root is harvested in late summer, after the leaves have died down, and is dried for later use[213, 238]. The whole plant is used as a poultice for tumours, inflammations and ulcers[222].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°c. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Landscape Uses:Border, Ground cover, Woodland garden. Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open deciduous woodland[1, 90]. Succeeds in a sunny position if the soil does not dry out[42]. Succeeds in deep shade[188]. A very hardy plant, tolerating temperatures down to about -35°c[238]. Plants are long-lived[233]. Any transplanting is best done whilst the plants are in flower[200]. A very variable species[200], it is subject to mutation[90]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238]. The flowers have an unattractive smell rather like putrefied flesh[42, 207, 245]. The white-flowered form, *blandium*, is almost scentless[245]. Plants can flower in two years from seed[138]. Special Features:Attractive foliage, North American native, Naturalizing, Flowers have an unpleasant odor.

(sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flowers - raw or cooked[105, 177, 183]. Some caution is advised, see the notes above on toxicity. Leaves - boiled[105, 177, 183]. Some caution is advised, see the notes above on toxicity.

tcanta Plants can be grown as ground cover when spaced about 1 metre apart each way[208].

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. Plants are hardy to about -20°c[184], but are deciduous in cold climates. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. This species is closely related to *R. indicum*[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.712 Rhododendron japonicum

Japanese azalea

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Rhododendron japonicum is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves[177]. No more details are given but some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Diuretic TonicDiuretic, tonic[174].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. This species is closely related to *R. molle* and perhaps not distinct from it[200]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200].

Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.713 Belamcanda chinensis

Leopard Lily, Blackberry lily, Leopard Flower

4 tlin 10 cyuc 1 kcaak 0 tcan 3 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Belamcanda chinensis is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 177]. Caution is advised, see the notes above on toxicity.

tcanta TanninThe root contains tannin[272].

dwatta Abortifacient Analgesic Antibacterial Antidote Antifungal Antiinflammatory Depurative Expectorant Febrifuge Hepatic Pectoral Purgative Stomachic TonicThe leopard lily has a very long history of use in traditional Chinese medicine. It is a bitter cooling herb that acts mainly on the lungs and the liver, lowering fevers and reducing inflammation[238]. It is effective against a number of bacterial, fungal and viral organisms[238] and has also been used as an antidote to snakebites[240]. The root contains several medically active constituents including flavonoids and isoflavonoids[279]. It also contains the glucosides belamcandin, tectoridin, shekanin and iridin[283]. It is analgesic, antibacterial, antifungal, anti-inflammatory, depurative, expectorant, febrifuge, pectoral, purgative, stomachic and tonic[46, 61, 147, 176, 178, 218, 238, 279, 283]. It is used in the treatment of acute laryngitis, acute tonsillitis, oedema of the glottis and cough with profuse sputum[176, 279]. The juice of the root is used in Nepal to treat liver complaints, where it has the added benefit of improving the appetite[272]. This juice is also used to abort a foetus during the first trimester of pregnancy[272]. The root should not be prescribed for pregnant women[238]. The root is harvested in the summer and autumn, and dried for later use[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Pre-chill stored seed for 7 days and sow spring in a cold frame. The seed germinates in 2 - 8 weeks at 20°c[134]. Prick out the seedlings into individual pots as soon as they are large enough to handle. They can be planted out in early autumn and should flower in the following year[200]. Division in spring or early autumn[200]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Landscape Uses:Border, Container, Massing, Woodland garden. Requires a fairly rich sandy or loamy soil in a bright sunny position or light shade. Succeeds in most soils[187]. Requires a position that stays moist in the summer[187]. Plants grow best in areas with long hot summers[238]. A fairly hardy plant, tolerating temperatures down to about -15°c[187] if given a deep dry mulch over the winter. A short lived plant, the bulbs are usually lifted in the autumn and stored in a cool but frost-free place over the winter, replanting them in the spring[233]. They can be left in the ground in the milder areas of the country so long as the soil is well-drained[233]. Individual flowers only live for one day, but the plant produces a succession of blooms over a period of several weeks[238]. Slugs really love this plant and can destroy even quite large clumps as they come into growth in the spring[K]. Special Features:Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

good loamy soil[1]. Succeeds in very poor soils[202]. Grows well in heavy clay soils. Prefers a moist well-drained soil in a sunny position with shade from the midday sun[200]. Hardy to about -20°c[184]. Plants are moderately fast growing[202]. They sucker freely and can be invasive[202]. Some named forms have been developed for their ornamental value[182]. This species is notably resistant to honey fungus[200]. The flowers are said to be usually unisexual but we do not know if the plants are dioecious or monoecious. Special Features: Not North American native, Attractive flowers or blooms.

## 5.2.708 Senecio cannabifolius

Aluetian ragwort  
4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Senecio cannabifolius is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - cooked[46, 61, 105]. A bitter taste should be removed by leaching the leaves or cooking them in more than one change of water[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta Anodyne Antirheumatic Contraceptive SkinThe plant (though the part used is not specified) is anodyne, antirheumatic, contraceptive and used in the treatment of skin complaints. It stimulates the circulation[147, 178]. A decoction is used in the treatment of amenorrhoea, abdominal distension and cramps, traumatic injuries, bruises and swellings[147].

propta Seed - sow spring in a greenhouse and only just cover the seed. Make sure the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer if they have grown sufficiently. Otherwise, grow them on in the greenhouse or cold frame for their first winter and plant them out the following year after the last expected frosts. Division in spring[200]. Root cuttings in early spring[200].

nwatta Succeeds in a sunny position in most moderately fertile well-drained soils[200].

## 5.2.709 Euonymus alatus

Winged Spindle Tree, Burningbush, Corky spindletree  
4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Euonymus alatus is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaY-oung leaves, boiled[105, 177]. The fruit may be edible[105, 177]. No further details are given, though we would recommend caution in eating any member of this genus[K]. The fruit is about 8mm in diameter[200]. The seed contains 20.5% protein, 44.4% fat and 3.9% ash[218]. These reports of edibility should be treated with some caution, see the notes above on toxicity. The flowers are a tea substitute[178, 218].  
tcanta Hedge HedgeThis species can be grown as a hedge, the var. compactus is normally used[29].

dwatta Anodyne Anthelmintic Antiphlogistic Antipruritic Astringent Blood tonic Cancer Carminative Emmenagogue HypoglycaemicThe stem and branches are alternative,

analgesic, anodyne, anthelmintic, anticoagulant, antiphlogistic, antipruritic, astringent blood tonic, carminative, emmenagogue, hypoglycaemic, and purgative[147, 178, 218, 279]. It is used in Korea to treat intestinal worms, suppressed menstruation and cancer[279]. A decoction is used in China in the treatment of 'cold' headache, general body aches, pruritis, irregular menstruation and other gynaecological diseases[147]. Plants contain the anticancer compound dulcitol[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[78, 98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Landscape Uses:Border, Erosion control, Foundation, Hedge, Massing, Screen, Standard, Specimen. Thrives in almost any soil, including chalk[200], it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[1]. A very ornamental and cold-tolerant plant[1], it tolerate temperatures down to about -25°c[184]. There are some named varieties developed for their ornamental value[182]. 'Compactus' is a more dense growing form for small gardens[182]. Special Features:Not North American native, Invasive, All or parts of this plant are poisonous, Inconspicuous flowers or blooms.

## 5.2.710 Euonymus oxyphyllus

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 2.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Euonymus oxyphyllus is a deciduous Tree growing to 2.5 m (8ft) by 2.5 m (8ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - boiled[105, 177]. Some caution is advised, see the notes above regarding possible toxicity.

tcanta WoodWood - hard, elastic, very fine grained. Used for stamps, printing blocks, mosaics etc[46, 61].

dwatta Women's complaintsThe plant is used in gynaecological applications[218].

propta Seed - best sown as soon as it is ripe in a cold frame[121]. Stored seed requires 3 months cold stratification, so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 7cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Thriving in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil. A very ornamental plant[11], it is hardy to about -25°c[184]. A slow growing plant, though it makes a large shrub in time[182].

## 5.2.711 Rhododendron kaempferi

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 2.5 m hkuc  
hmim cyutli tcup hwicli hrasjlut hpa7tli frusfat hpa7tmwatli xre7t hjonli

drutta Rhododendron kaempferi is an evergreen Shrub growing to 2.5 m (8ft) by 2.5 m (8ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light

## 5.2.588 Mimulus lewisii

Great Purple Monkey Flower, Purple monkeyflower  
4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Mimulus lewisii is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The flowers are pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - raw or cooked[172].

tcanta None known  
dwatta PoulitcePoulitce[172].

propta Seed - sow spring in a greenhouse and only lightly cover the seed[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can also be sown in situ in late spring after the last expected frosts[200]. Division in spring[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings of softwood, 5cm long in spring or summer[200].

nwatta Prefers rather moist places such as damp borders, margins of streams and boggy spots[1]. Grows well in heavy clay soils. Thrives in full sun so long as the soil does not dry out[200], otherwise it is best grown in partial shade[187]. This species tolerates slightly drier conditions than *M. guttatus*, it prefers a rich soil in light woodland[200]. Hardy to at least -20°c[187]. Another report says that plants are only hardy in the milder parts of Britain[233]. There is some confusion over the naming of this plant, the entry on edibility may refer to *M. luteus*, which is closely related to this species.

## 5.2.589 Cardamine bulbifera

Coral Root, Coralroot bittercress  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfjxre7t hjonli

drutta Cardamine bulbifera is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[K]. A hot cross-like flavour. Bulbils - raw or cooked. They are rather small, about the size of a lentil, but have a pleasant mild cross-like flavour[K]. Root - raw or cooked[K]. A hot flavour, it is pleasant but rather small[K].

tcanta None known  
dwatta None known

propta Seed - best sown when ripe, otherwise sow it in the spring. If you have sufficient seed it can be sown in situ, otherwise it is best to sow it in pots in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and pant out in the summer. The bulbils can be collected in early summer and potted up. Keep them in a cold frame over the winter and plant out when in active growth in the spring.

nwatta Prefers a moist humus rich soil in shade or semi-shade[200]. The flowers are rarely visited by pollinating insects and seed is rarely set, propagation is carried out by means of bulbils formed on the axils of the upper leaf stems[17, K].

## 5.2.590 Nepeta raphanorrhiza

4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Nepeta raphanorrhiza is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[177]. An almond flavour[105].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame in the autumn[200]. The germination of spring sown seed can be erratic[200], it is best sown in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. If you have sufficient freshly ripe seed then it is well worth trying a sowing outdoors in situ in the autumn. Division in spring or autumn[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in late spring or early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Easily grown in a well-drained soil in a sunny position[200]. Plants are bushier when grown in fertile soils[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A good bee plant[108].

## 5.2.591 Muscari neglectum

Grape Hyacinth, Starch grape hyacinth  
4 tin 7 cyuc 2 kcaak 2 tcan 0 dwat 0.3 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfjxre7t hjonli

drutta Muscari neglectum is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb - cooked[2, 132, 177, 183]. The bulb is up to 25mm diameter[200]. One report says that the bulb might be poisonous[4]. The flowers, sprinkled over rhubarb, add a wonderful scented flavour[183].

tcanta Landscape Uses: Border, Container, Massing, Rock garden, forest garden.

dwatta None known  
propta Seed - best sown as soon as ripe in a greenhouse[200]. The seed can also be sown in early spring in a greenhouse. A good proportion of the seed usually germinates within 2 - 3 months. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first year of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in late summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. Division of offsets in July/August after the leaves die down[1]. It can be done every other year if a quick increase is required[1]. Larger bulbs can be replanted direct into their permanent

positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late summer.

nwatta Prefers a rich open well-drained soil and a sunny position[1, 90]. Easily grown in any well-drained soil[90]. Grows very well in short grass[1], increasing freely[42] and it can become invasive[200]. A very variable plant[89, 200]. The flowers secrete lots of nectar and are a valuable bee plant in the spring[4]. The flowers are said to have a smell like wet starch[4] whilst another report says that they are deliciously plum-scented[245]. Special Features:Attractive foliage, Naturalizing, Fragrant flowers.

## 5.2.592 Viola tricolor

Heartsease, Johnny jumpup, Field Pansy, 4 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyixre7t hjonli

drutta Viola tricolor is a ANNUAL/PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to September, and the seeds ripen from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: TeaYoung leaves and flower buds - raw or cooked[105]. When added to soup they thicken it in much the same way as okra[85, 159]. A tea can be made from the leaves[85]. The small attractive flowers are added to salads or used as a garnish[183].

tcanta Dye LitmusYellow, green and blue-green dyes are obtained from the flowers[168]. The leaves can be used in place of litmus in testing for acids and alkalis[4].

dwatta Anodyne Antiasthmatic Antiinflammatory Antiseborrheic Antispasmodic Cardiac Demulcent Depurative Diaphoretic Diuretic Eczema Emetic Emollient Epilepsy Expectorant Homeopathy Laxative VulneraryHeartsease has a long history of herbal use and was at one time in high repute as a treatment for epilepsy, asthma, skin diseases and a wide range of other complaints[4]. In modern herbalism it is seen as a purifying herb and is taken internally in the treatment of skin complaints such as eczema[254]. The herb is anodyne, antiasthmatic, anti-inflammatory, cardiac, demulcent, depurative, diaphoretic, diuretic, emollient, expectorant, laxative and vulnerary[4, 7, 9, 13, 21, 46, 165]. Being expectorant, it is used in the treatment of various chest complaints such as bronchitis and whooping cough, whilst its diuretic action makes it useful for treating rheumatism, cystitis and difficulty in passing urine[254]. It is also used as an ointment for treating eczema and other skin complaints and is also useful in cases of rheumatism, bed-wetting etc[4, 9]. The plant is harvested from June to August and dried for later use[4]. The root is emetic[7]. A homeopathic remedy is made from the entire plant[4]. It is used in the treatment of cutaneous eruptions[4].

propta Seed - best sown in the autumn in a cold frame. Division in the autumn or just after flowering. The plant is a short-lived perennial and division is not that worthwhile.

nwatta Landscape Uses:Alpine garden, Border, Container, Massing, Rock garden. Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds[31, 53]. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high[200]. Prefers a pH between 6 and 6.5[200]. A very variable species[4]. It is normally an annual plant, but it is sometimes a short-lived perennial[187]. A good bee plant[24]. Grows well with rye but dislikes growing with wheat[18]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. Special Features:Not North American native, Naturalizing, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Fragrant flowers.

## 5.2.593 Fritillaria verticillata

4 tin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli hgatkuyctup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Fritillaria verticillata is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - cooked or candied[183]. The bulb is about 2cm in diameter[266]. Young plant - cooked. Used in soups[183]. Eating the young plant will greatly reduce the vigour of the bulb, and could even kill it[K]. Petals and flower buds - cooked. Used in soups[183].

tcanta None known

dwatta Antidote Antitussive Astringent Cancer Expecto-rant GalactogogueThe bulbs are antidote, antitussive, astringent, expectorant, galactogogue and purgative[116, 218]. They contain fritimine which diminishes excitability of respiratory centres, paralyses voluntary movement and counters effects of opium[61]. The bulb is used internally in the treatment of coughs, bronchitis, pneumonia, feverish illnesses, abscesses etc[238]. The bulbs also have a folk history of use against cancer of the breast and lungs in China[218, 238]. This remedy should only be used under the supervision of a qualified practitioner, excessive doses can cause breathing difficulties and heart failure[238]. The bulbs are harvested in the winter whilst they are dormant and are dried for later use[238].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta Prefers a moist peaty soil in the open garden[90]. Easily grown in a moderately fertile soil in sun or semi-shade[200]. Succeeds in drier soils and is drought tolerant when established[190]. The scaly bulbs are best planted on their sides or surrounded in sand to prevent water collecting in their hollow crowns[238]. Cultivated as a medicinal plant in Japan[90], the sub-species *F. verticillata thunbergii*. Baker. is most often used[61]. (this species is now known as *F. thunbergii*. q.v.). Plants take 3 - 5 years to flower from seed.

## 5.2.594 Aquilegia flavescens

Columbine, Yellow columbine

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aquilegia flavescens is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K].

drainage can lead to root rot, North Carolina State University advises the use of raised beds if the plant is going to be grown in soil that contains a lot of clay. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 5.2.705 Spiraea prunifolia

Bridalwreath Spiraea

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Spiraea prunifolia is a deciduous Shrub growing to 2.5 m (8ft) by 2.5 m (8ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known

dwatta Emetic MalariaThe plant is emetic[218]. It is used in the treatment of malaria and fever[218].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Hardy to about -20°C[184]. Hybridizes freely with other members of this genus[11]. Flowers are produced on the previous seasons growth and any pruning is best done immediately after flowering in order to promote new growth and plenty of flowers in the following year[182]. This species is notably resistant to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Blooms are very showy.

## 5.2.706 Convolvulus arvensis

Field Bindweed

4 tin 8 cyuc 1 kcaak 1 tcan 2 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli priklwis hpa7tmwatli fyixre7t hjonli

drutta Convolvulus arvensis is a PERENNIAL CLIMBER growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe plant has been used as a flavouring in a liqueur called 'Noyeau'[2]. No details are given as to which part of the plant is used[K].

tcanta Dye StringThe stem is used as a twine for tying up plants etc[6, 99]. It is fairly flexible and strong but not long-lasting. A green dye is obtained from the whole plant[168].

dwatta Cholagogue Diuretic Laxative Purgative Stings Women's complaintsThe root, and also a resin made from the root, is cholagogue, diuretic, laxative and strongly purgative[4, 7, 9, 13, 240]. The dried root contains 4.9% resin[240]. The juice of the root is used in the treatment of fevers[272]. A tea made from the flowers is laxative and is also used in the treatment of fevers and wounds[222]. A cold tea made from the leaves is laxative and is also used as a wash for spider bites or taken internally to reduce excessive menstrual flow[222, 257].

propta Seed - best sown in situ as soon as it is ripe, it germinates in the autumn[164]. This species can become a real pest in the garden so it is unwise to encourage it.

nwatta Prefers a lighter basic soil[17] of low to medium fertility[200]. Bindweed is a very deep-rooting plant with a vigorous root system that extends to a considerable distance and is very hard to eradicate from the soil. Even a small piece of the root will grow into a new plant if it is left in the ground. Once established this plant soon becomes a pernicious weed[1, 4]. It is a climbing plant that supports itself by twining around any support it can find and can soon swamp and strangle other plants[4]. The flowers close at night and also during rainy weather[4]. Although visited by numerous insects, the flowers seldom set fertile seed[4]. On sunny days the flowers diffuse a scent of heliotrope[245]. The plant harbours tobacco mosaic virus of the Solanaceae[13] and so should not be grown near potatoes, tomatoes and other members of that family.

## 5.2.707 Kerria japonica

Bachelor's Button, Japanese rose, Jew's Mallow, Japanese Kerria

4 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Kerria japonica is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Young leaves - cooked[105, 177]. The leaves contain a small amount (0.002%) of hydrogen cyanide and are also a rich source of vitamin C (200mg per 100g)[218]. Some caution is advised, see the notes above on toxicity. Fruit[177]. No more details are given, but this report is somewhat suspect, the plant does not produce a fleshy fruit and the seed case certainly does not look edible[K]. The fruit is a dry, somewhat plump achene about 5mm in diameter[200].

tcanta None known

dwatta Vitamin C Women's complaintsA decoction of the flowering shoots is used in the treatment of coughs and women's complaints[178, 218].

propta Seed - we have no details on this species but suggest sowing the seed as soon as it is ripe in a cold frame. Sow stored seed as soon as possible in a cold frame, it is likely to require a period of cold stratification. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers, removed with care from established plants during the dormant season[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings of young shoots. Young basal shoots in early summer work quite well. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Layering.

nwatta Landscape Uses:Container, Foundation, Pest tolerant, Massing, Specimen. Succeeds in most aspects in any

Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, Attractive foliage, Not North American native, Naturalizing, Wetlands plant, Attracts butterflies, Attractive flowers or blooms.

## 5.2.702 Sanguisorba stipulata

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli  
drutta Sanguisorba stipulata is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - cooked. They are not choice[172].

tcanta None known  
dwatta AstringentBoth the roots and the leaves are astringent[172].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the spring.

nwatta Succeeds in ordinary garden soil[1]. Prefers a good moist soil that does not dry out in the summer, in sun or partial shade[187, 200]. Very closely related to *S. canadensis*[60], and considered to be no more than part of that species by some botanists[200].

## 5.2.703 Euonymus atropurpureus

Wahoo- Indian Arrow Wood - Burning Bush, Eastern wahoo  
4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 2.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Euonymus atropurpureus* is a deciduous Shrub growing to 2.5 m (8ft 2in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: FruitEdible Uses: Although the fruit has sometimes been eaten, it is considered to be poisonous by some writers and so should definitely be avoided[213]. The fruit is about 15mm in diameter[200].

tcanta WoodWood - heavy, hard, tough, very close grained[82, 227]. It weighs 41lb per cubic foot[227], but is too small to be of commercial value[229].

dwatta Alternative Cardiac Cathartic Cholagogue Diuretic Eczema Emetic Expectorant Hepatic Malaria TonicWahoo was used in various ways by the North American Indians, for example as an eye lotion, as a poultice for facial sores and for gynaecological conditions[254]. In current herbalism it is considered to be a gallbladder remedy with laxative and diuretic properties[254]. The bark, however, is toxic and should only be used under professional supervision, it should not be given to pregnant women or nursing mothers[254]. The stem and root bark is alterative, cardiac, cathartic, cholagogue, diuretic, expectorant, hepatic, laxative, stimulant and tonic[4, 21, 46, 61, 222]. The root bark is the part normally used, though bark from the stems is sometimes employed as a substitute[4]. In small doses it stimulates the appetite, in larger doses it irritates the intestines[4]. The bark is especially useful in the treatment of biliousness and liver disorders which follow or accompany fevers[4, 254] and for treating various skin disorders such as eczema which could arise from poor liver and gallbladder function[254]. It is also used as a tea in the treatment of malaria, liver congestion, constipation etc[222]. The powdered bark, applied to the scalp, was believed to eliminate dandruff[222]. The bark and

the root contain digitoxin and have a digitalis-like effect on the heart[213, 222]. They have been used in the treatment of heart conditions[254]. The bark, which has a sweetish taste, is gathered in the autumn and can be dried for later use[213]. A tea made from the roots is used in cases of uterine prolapse, vomiting of blood, painful urination and stomach-aches[222]. The seed is emetic and strongly laxative[222].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[78, 98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Thrives in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[1]. Requires shade from the midday sun[1, 11]. A moderately fast-growing but short-lived tree in the wild[229].

## 5.2.704 Rhododendron periclymenoides

Pink azalea, Pinxter flower  
4 tin 8 cyuc 1 kcaak 2 tcan 0 dwat 2 m hkuc pcmhmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli hjonli

drutta *Rhododendron periclymenoides* is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Birds, Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta An irregular growth on the twigs is eaten as a thirst quencher. It can be sliced and mixed with tossed salads. It is also pickled in spiced vinegar [1-4]. *Rhododendron periclymenoides* is highly toxic and all parts of the plant are poisonous and could be fatal if ingested. Honey which is made by bees who collect pollen from genus *Rhododendron* spp. is referred to as "mad honey". Humans who ingest this honey begin exhibiting symptoms including salivation abdominal pain, diarrhea, vomiting, difficulty breathing, paralysis and coma. as well as hypotension and other irregularities of cardiac rhythm.

tcanta *Rhododendron periclymenoides* has been used in horticulture as an ornamental plant. Common landscape uses for the plant are as a foundation plant and as shrub borders. Other locations are shrub borders, mixed borders, woodland gardens and shade gardens. Also effective in foundation plantings or as a hedge.

dwatta None known  
propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta *A Perennial shrub*. Sun Requirements: Full Sun to Full Shade. Water Preferences: Mesic/moist. It is relatively tolerant of dry sites. Soils in which *R. periclymenoides* grows best are typically acidic, rich in hummus and retain moisture but should still have some drainage. Soil pH Preferences: Very strongly acid (4.5 - 5.0) to Slightly acid (6.1 - 6.5). Fruiting Time: Late summer or early fall. Fruit: Edible to birds. Flowers: Showy. Fragrant. Flower Color: Pink, White. Flower Time: Spring. Suitable Locations: Bog gardening. Uses: Windbreak or Hedge. Cut Flower: Will Naturalize. Wildlife Attractant: Bees, Birds, Butterflies. Many animals and birds utilize shrubs like *R. periclymenoides* for cover on the forest floor. The roots also provide erosion control and protection for watersheds. Since lack of proper

tcanta Parasiticide ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveAntispasmodic, diaphoretic, parasiticide, Resolvent, salve[172].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. A very ornamental plant[1], it is closely related to *A. formosa* and hybridizes with it where their ranges overlap[200, 270]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.595 Chenopodium ficifolium

Fig-Leaved Goosefoot  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Chenopodium ficifolium* is a ANNUAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: CondimentLeaves and flower buds - cooked[12, 105, 177]. Used like spinach or added to soups etc[183]. The raw leaves should only be eaten in small quantities, see the notes above on toxicity. Seed - roasted and used as a condiment[105]. Used like sesame for flavouring foods[183].

tcanta DyeGold/green dyes can be obtained from the whole plant[168].

dwatta None known  
propta Seed - sow spring in situ. Most of the seed usually germinates within a few days of sowing.

nwatta An easily grown plant, succeeding in most soils but disliking shade[1, 200]. It prefers a moderately fertile soil[200].

## 5.2.596 Aquilegia canadensis

Wild Columbine, Red columbine, Meeting Houses, Common Columbine  
4 tin 10 cyuc 2 kcaak 2 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta *Aquilegia canadensis* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers RootEdible Uses: Flowers - raw. Sweet and delightful[172]. Rich in nectar[213], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching punch in the garden[K]. Root[2, 105, 177]. These reports possibly refer to the root being chewed for its medicinal virtues[K]. Caution is advised, see notes above on toxicity[172].

tcanta Essential Parasiticide ParasiticideThe seed is rubbed into the scalp to rid the hair of lice[172, 222]. The crushed seed is pleasantly aromatic and is used as a perfume. The fragrance persists for a long time[207].

dwatta Anodyne Antispasmodic Astringent Diaphoretic Diuretic Febrifuge Parasiticide Parasiticide Resolvent SalveAntispasmodic, diaphoretic, parasiticide, resolvent, salve[172, 222]. The root is astringent and diuretic[222, 257]. It is chewed or made into a weak tea for the treatment of diarrhoea and stomach aches[222]. The tea is used in the treatment of uterine bleeding[222]. The boiled plant was used as a hair wash[213]. The seed is anodyne and febrifuge[257]. An infusion is used in the treatment of headaches and fevers[257].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Landscape Uses:Alpine garden, Container, Foundation, Massing, Rock garden, Woodland garden. An easily grown and very tolerant plant[K], it succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. Does well in semi-shade[111]. Prefers a rather poor slightly acid soil[111]. A very ornamental and cold-hardy plant, it tolerates temperatures down to about -25°C[1,187]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Plants are pollinated by humming birds in the wild[187]. Most species in this genus are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Special Features:Attracts birds, North American native, Naturalizing, Wetlands plant, Attracts butterflies, Suitable for cut flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.597 Thymus quinquecostatus

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.1 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Thymus quinquecostatus* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: CondimentThe plant is the source of an essential oil that is used as a food flavouring[177, 183]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can

be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Grows well between stepping stones on paths, tolerating light treading[183, 200]. Succeeds on walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 5.2.598 *Salvia lavandulifolia*

Spanish Sage

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.3 m hkuic htut cyutli kyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Salvia lavandulifolia* is an evergreen Shrub growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Condiment TeaThe aromatic leaves are used as an adulterant for the common sage[177, 183]. They are used as a substitute for sage in commercial food flavourings[238]. A sage-like tea is made from the dried leaves[238]. The plant is a source of an essential oil that is used commercially to flavour ice cream, sweets, baked goods, chewing gum, soft drinks etc[183, 238].

tcanta EssentialThe essential oil obtained from the leaves is used in perfumery and to perfume soaps and cosmetics[238].

dwatta Alterative Antiseptic Astringent Depurative Digestive Expectorant Febrifuge TonicThe leaves are alterative, antiseptic, astringent, depurative, digestive, expectorant, febrifuge and tonic[238]. They are used internally in the treatment of digestive and respiratory complaints, menstrual problems, infertility, nervous tension and depression[238]. This remedy should not be prescribed to pregnant women[238]. The leaves can be harvested as required and used fresh, or they can be harvested before the flowers open and dried or distilled for their essential oil[238].

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a light well-drained soil in a sunny position[182, 200]. Soils rich in nitrogen encourage excessive leaf growth at the expense of flowering[11]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. It is as hardy as common sage, *S. officinalis*[182], to which it is closely related[11]. Plants can be killed by excessive winter wet[200]. The leaves have a pungent lavender scent[182]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.599 *Chenopodium vulvaria*

Stinking Goosefoot. Arrach - Wormseed

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuic htut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwishsom hpa7tmwatli xre7t hjonli

drutta *Chenopodium vulvaria* is an ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves and flower buds - cooked and used like spinach. The raw leaves should only be eaten in small quantities, see the notes above on toxicity. Although edible, the smell of the leaves would discourage most people from using this plant[K]. Seed - cooked. Ground into a powder, mixed with wheat or other cereals and used in making bread etc. The seed is small and fiddly, it should be soaked in water overnight and thoroughly rinsed before it is used in order to remove any saponins.

tcanta DyeGold/green dyes can be obtained from the whole plant[168].

dwatta Antispasmodic Eczema Emmenagogue Women's complaintsThe whole plant is antispasmodic and emmenagogue[4]. Used to expel worms from the bowel. [301] Also used for the fungal infections and as a cardiac stimulant. Form of treatment for acute gout [301]. An infusion of the dried leaves is used in the treatment of hysteria and nervous troubles connected with women's ailments[4]. In Chinese medicine wormseed oil is used for rheumatism, eczema and bites [301].

propta Seed - sow spring in situ. Most of the seed usually germinates within a few days of sowing.

nwatta An easily grown plant, succeeding in most soils but disliking shade[1, 200]. It prefers a moderately fertile soil[200]. The plant contains trimethylamine, and when touched it gives off the nauseous odour of stale salt fish[4, 17].

## 5.2.600 *Lapsana communis*

Nipplewort, Common nipplewort

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuic hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli priklwis hpa7tmwatli fyfxre7t hjonli

drutta *Lapsana communis* is an ANNUAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and shoots - raw or cooked[2, 5, 17, 100]. They are best harvested before the plant comes into flower[9]. The leaves can be added to salads, cooked like spinach or added to soups and casseroles[9, 183]. They have a bitter or radish-like taste[183].

tcanta None known

dwatta None known

propta Seed - sow in situ during the spring or as soon as it is ripe and only just cover the seed. Plants usually self sow when they are well-sited.

nwatta A fairly common garden weed, nipplewort will maintain itself in the garden so long as it is given some disturbed soil in which to self-sow. It is a fairly tolerant plant that succeeds in most soils, so long as they are not too acid, and dislikes heavy shade. It was at one time cultivated as a vegetable[17].

propta Seed - sow spring in a cold frame in a free draining compost and only just cover. The seed usually germinates in 1 - 3 months at 15°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring whilst dormant[200].

nwatta Easily grown in ordinary garden soil in a sunny position, but plants are apt to become invasive[1, 200]. Nearly all taxa in *Calystegia* intergrade geographically into neighboring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically[266].

## 5.2.699 *Euonymus hamiltonianus maackii*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuic hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Euonymus hamiltonianus maackii* is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - boiled[105, 177]. This report should be treated with some caution since many members of this genus are poisonous.

tcanta LatexRoots yield up to 6% gutta-percha, a non-elastic rubber used as an electrical insulator and in making plastics etc[74].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113]. Stored seed requires 3 months cold stratification so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate[74]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, taken at a node, July/August in a frame. Very easy[200]. Root cuttings in winter[113].

nwatta Thriving in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[1]. Cultivated for its latex in Russia, producing most when grown in open arid habitats[74].

## 5.2.700 *Pimpinella major*

Greater Burnet Saxifrage, Hollowstem burnet saxifrage

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat m hkuic hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta *Pimpinella major* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentAn essential oil from the roots is used as a flavouring in candy, liqueurs etc[183].

tcanta None known

dwatta Antiinflammatory Astringent Carminative Digestive ExpectorantThe leaves are diaphoretic, diuretic, resolvent and stomachic[4]. The plant is harvested as it comes into flower and dried for later use[4]. The root is anti-inflammatory, mildly astringent and expectorant[9]. The

fresh root is very hot and acrid, but this pungency is greatly reduced when the root is dried[4]. When chewed, the fresh root is effective in treating toothaches and paralysis of the tongue[4]. An effective diuretic, the root is used in treating disorders arising from obstructions of the viscera[4]. The root is also used for soothing coughs or the effects of laryngitis and bronchitis[9]. The roots can be harvested in the spring or autumn and are dried for later use[9]. The seeds are carminative[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Pimpinella major* Greater Burnet Saxifrage for cough/bronchitis (see [302] for critics of commission E).

propta The seed requires a period of cold stratification. If you can obtain fresh seed then it is best sown immediately. This can be done in situ if you have sufficient seed, but if you only have a small quantity then it is safer to sow it in pots in a cold frame. Sow stored seed as soon as you can obtain it, this is probably best done in a cold frame. When they are large enough to handle, prick the pot-grown seedlings out into individual pots and plant them out in the summer.

nwatta Easily grown in any good soil[1], preferring rather moist conditions[187]. Grows best in a cool position[233]. Plants are hardy to about -20°C[187].

## 5.2.701 *Cornus amomum*

Silky Dogwood

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 3 m hkuic hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta *Cornus amomum* is a deciduous Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 161, 177]. Said to be very good to eat[2]. The fruit is 8mm in diameter[235].

tcanta TeethThe powdered bark is used as a toothpowder[61].

dwatta Antiperiodic Astringent Diuretic Poulitice Stimulant Stomachic VDThe dried root-bark is antiperiodic, astringent, stimulant (mild), tonic[4]. The flowers are said to have similar properties[4]. A tea or tincture of the astringent root bark has been used as a quinine substitute and also in the treatment of chronic diarrhoea[4]. It has also been employed in the treatment of painful urination, chest congestion etc[257]. The bark was also used as a poultice on external ulcers and as a wash for gonorrhoea sores[4, 257]. The glycoside 'cornin' found in the bark has astringent properties[4]. The fruits are used as a bitter digestive tonic. A tincture of them has been used to restore tone to the stomach in cases of alcoholism[4].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Border, Massing, Specimen, Woodland garden. An easily grown plant that thrives in Britain, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188].



for treating complaints such as dizziness, coughs, insomnia, exhaustion[232], arteriosclerosis and prostate problems[7]. propta Seed - best sown in situ as soon as it is ripe in the late summer. It usually germinates in the autumn.

nwatta A fairly common weed in Britain, it succeeds in most soils in sun or light shade and avoids acid soils in the wild. It prefers a damp rich soil[238]. This is the plant that Socrates is said to have used to kill himself, though this is probably an error[207]. It requires a large dose if it is to be lethal (this contradicts with the notes above on toxicity[K]), and death from this plant can be very painful whilst Socrates is said to have died without pain[207]. Another report says that poisonous doses cause paralysis, which starts at the feet and moves up the body. There is no pain, the mind remains clear and lucid until death, which is caused by asphyxia when paralysis reaches the chest[232]. The whole plant has a foetid smell[7].

## 5.2.695 Euonymus macropterus

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Euonymus macropterus is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - boiled[105, 177]. Some caution is advised, see the notes above on possible toxicity.

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[121]. Stored seed requires 3 months cold stratification, so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 7cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Thriving in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[11]. Plants are hardy to about -25°c[184].

## 5.2.696 Cystopteris montana

Mountain Bladder Fern

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc pcmihmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli hjonli

drutta Cystopteris montana is a deciduous Fern growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. The seeds ripen from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root. An emergency food, it is only used when all else fails[172].

tcanta None known

dwatta None known

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Germinates in 1 - 3 months at 20°c[164].Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Division in spring.

nwatta Prefers a shady position in a moist but well-drained soil, succeeding in most soil types[200]. Plants can tolerate up to 4 hours direct sun per day[200]. Prefers a

pH between 6.5 and 7, but tolerates a range from 5.5 to 7.5[200]. Prefers high humidity, plants die back early in dry seasons[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1]. Plants spread by means of a creeping rhizome[1].

## 5.2.697 Viburnum mongolicum

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli dyatxre7t hjonli

drutta Viburnum mongolicum is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[179].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. This species is closely related to *V. dilatatum*[179].

## 5.2.698 Calystegia subvolubilis

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Calystegia subvolubilis is a PERENNIAL CLIMBER growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[105]. Some caution is advised, see the notes above on toxicity. Young shoots - cooked[105]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known

## 5.2.601 Rumex crispus

Curled Dock, Curly dock

4 tlin 8 cyuc 2 kcaak 2 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Rumex crispus is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Coffee-Leaves - raw or cooked[5, 85, 159]. They can also be dried for later use[12]. The leaves can be added to salads, cooked as a potherb or added to soups[183]. Only the very young leaves should be used, preferably before the stems have developed, and even these are likely to be bitter[12, 95, 257]. If used in early spring and in the autumn they can often be fairly pleasant tasting[85, 159, K]. The leaves are very rich in vitamins and minerals, especially iron and the vitamins A and C[183, 244]. A nutritional analysis is available[218]. Stems - raw or cooked[257]. They are best peeled and the inner portion eaten[257]. Seed - raw or cooked[172, 257]. It can be used as a piñole or can be ground into a powder and used as a flour for making pancakes etc[85, 102, 183, 257]. The seed is very finely used to harvest and prepare[62]. The roasted seed has been used as a coffee substitute[207].

tcanta Compost DyeYellow, dark green to brown and dark grey dyes can be obtained from the roots. They do not need a mordant[168]. An alternative ingredient of 'QR' herbal compost activator[32]. (is it the flowers?) This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K].

dwatta Alterative Antiscorbatic Astringent Cancer Cholagogue Depurative Homeopathy Laxative Poulitce Salve TonicCurled dock has a long history of domestic herbal use. It is a gentle and safe laxative, less powerful than rhubarb in its action so it is particularly useful in the treatment of mild constipation[254]. The plant has valuable cleansing properties and is useful for treating a wide range of skin problems[254]. All parts of the plant can be used, though the root is most active medicinally. The root is alterative, antiscorbatic, astringent, cholagogue, depurative, laxative and mildly tonic[4, 21, 46, 94, 165]. It used to be sold as a tonic and laxative[212]. It can cause or relieve diarrhoea according to the dose, harvest time and relative concentrations of tannin(astringent) and anthraquinones (laxative) that are present[222]. It is used internally in the treatment of constipation, diarrhoea, piles, bleeding of the lungs, various blood complaints and also chronic skin diseases[4, 238, 257]. Externally, the root can be mashed and used as a poultice and salve, or dried and used as a dusting powder, on sores, ulcers, wounds and various other skin problems[257]. The root has been used with positive effect to restrain the inroads made by cancer, being used as an alterative and tonic[4]. The root is harvested in early spring and dried for later use[4]. Some caution is advised in its use since excess doses can cause gastric disturbance, nausea and dermatitis[222, 238]. The seed is used in the treatment of diarrhoea[4, 218]. A homeopathic remedy is made from the fresh root, harvested in the autumn before frost has touched the plant[232]. It is only used in the treatment of a specific type of cough[232].

propta Seed - this plant does not require any help in its propagation.

nwatta Succeeds in most soils, preferring a moist moderately fertile well-drained soil in a sunny position[200]. The plant does not need any help in growing, it is doing very nicely in Britain where it is a serious weed of agriculture. A very important food plant for the caterpillars of many species of butterfly[30]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.602 Erythronium oregonum

Giant White Fawnlily

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.5 m hkuc hmim cyutli tcup hwicli hrasljut hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Erythronium oregonum is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw, cooked or dried for later use[183, 257]. The bulb is from 25 - 60mm long[270]. Some caution should be employed, see the notes above on toxicity[256].

tcanta None known

dwatta PoulitceThe crushed corm is used as a poultice for boils[207, 257].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame. Water lightly in summer; it should germinate in autumn or winter[164, 200]. Stored seed requires a period of cold stratification[164]. Sow as early in spring as possible in a cold frame. Sow the seed thinly so that it will not be necessary to prick them out for their first year of growth. Give an occasional liquid feed to the seedlings to make sure that they do not become nutrient deficient. When the plants are dormant, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on in a shady position in the greenhouse for another 2 3 years and then plant them out into their permanent positions when they are dormant in late summer. Division of the bulbs in the summer as the leaves die down[1]. Larger bulbs can be replanted immediately into their permanent positions, but it is best to pot up smaller bulbs and grow them on in a shady position in a greenhouse for a year before planting them out when dormant in late summer.

nwatta Prefers slightly acid soil conditions but succeeds in chalky soils if these contain plenty of humus[164]. Requires semi-shade, preferably provided by trees or shrubs, and a well-drained soil[42, 164]. Succeeds in almost any light soil, preferring one that is rich in humus[1]. Plants are hardy to about -15°c[90]. Flowers are produced in 3 - 4 years from seed[164]. Plants increase rapidly by offsets[188]. Bulbs should be planted about 7cm deep[1]. This species is closely related to *E. revolutum* and occasionally hybridizes with it where their ranges meet[270]. In addition, *E. citrinum* and *E. hendersonii* are reported to hybridize with *E. oregonum* in the southern part of its range[270]. This species is closely related to *E. californicum*[200].

## 5.2.603 Apocynum cannabinum

Indian Hemp

4 tin 8 cyuc 2 kcaak 3 tcan 2 dwat 0.6 m hkuc pcmimhmtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwatli xre7t hjonli

drutta Apocynum cannabinum is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: GumSeed - raw or cooked[257]. It can be ground into a powder and used as a meal[94]. A latex obtained from the plant is used as a chewing gum[61, 94, 177]. After the latex has been squeezed from the plant it s allowed to stand overnight to harden into a white gum[257]. The latex was sometimes mixed with clean clay[257].

tcanta Fibre Gum LatexThe flowers are attractive to bees[418 ]. Other Uses: A very good quality fibre obtained from the bark is used for making clothes, twine, bags, linen, paper etc[1, 46, 61, 92, 94, 95, 189, 257]. It is about 12 -

18mm long[189]. Very strong[99], it is used as a flax substitute[57], it does not shrink and it retains its strength in water[99]. The fibre is produced late in the season[85], it can be harvested after the leaves fall in autumn but are probably at its best as the seed pods are forming[169]. When making paper, the stems can be retted by leaving them in the ground until they are dry in the winter or they can be harvested in late summer, the leaves removed and the stems steamed to remove the fibre[189]. The stems are then cooked for two hours with lye and pounded with mallets[189]. The plant yields a latex which is a possible source of rubber[46, 61, 177]. The latex is also used as chewing gum. Carbon Farming - Industrial Crop: hydrocarbon, fibre. The dogbane-milkweed family Asclepias, Apocynum, Calotropis, and Trachomitum spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed fibre or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

dwatta Antirheumatic Cardiotonic Diaphoretic Diuretic Emetic Expectorant Tonic Urinary VD Vermifuge WartsIndian hemp is an unpleasantly bitter stimulant irritant herb that acts on the heart, respiratory and urinary systems, and also on the uterus[238]. It was much employed by various native North American Indian tribes who used it to treat a wide variety of complaints including rheumatism, coughs, pox, whooping cough, asthma, internal parasites, diarrhoea and also to increase milk flow in lactating mothers[257]. The plant is still used in modern herbalism, but it should be used with great caution, and only under the supervision of a qualified practitioner if taken internally[[4, 222, 238]. See the notes above on toxicity[4, 222]. The root is cardiotonic, diaphoretic, diuretic, emetic and expectorant[4, 46, 61, 94, 238]. It is harvested in the autumn and dried for later use[238]. The fresh root is the most active part medicinally. It has been used in the treatment of syphilis and as a tonic[207]. A weak tea made from the dried root has been used for cardiac diseases[207, 222]. A tea made from the root has been used as a vermifuge[213]. The milky sap is a folk remedy for venereal warts[222].

propta Seed - best sown as soon as it is ripe in late summer and overwintered outdoors. The seed requires a period of cold stratification if it is to germinate well[238]. Prick out the seedlings when large enough to handle and grow them on in a cold frame for their first winter, planting out in late spring of the following year[K]. Division in spring just before active growth begins[200]. Plants can also be divided in the autumn[238].

nwatta Industrial Crop: Fiber Industrial Crop: Hydrocarbon Management: Hay Minor Global CropSucceeds in sun or shade in most well-drained moist soils[169, 238]. Plants can be invasive[200]. The young shoots of this plant are extremely attractive to slugs[K]. Carbon Farming - Cultivation: minor global crop. Management: hay.

### 5.2.604 Carlina acaulis

Stemless Carline Thistle

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli kyuctcup hwicli hyishrasljutnyik hpa7tli flatpriklwissip hpa7tmwatli fyfjxre7t hjonli

drutta Carlina acaulis is a BIENNIAL/PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Root StemEdible Uses: Flowering head - cooked. Used as a globe artichoke substitute[177, 183], though they are considerably smaller and even more fiddly[K]. The fleshy centre of the plant is edible[7, 105]. Does this refer to the peeled stem?[K]. Root[13]. No more details are given.

tcanta Weather forecastingThe dried flowers respond to the amount of humidity in the air and can be used as hygrometers[100]. Flowers on the growing plant close at the approach of rain[268].

dwatta Antispasmodic Carminative Diaphoretic Digestive Diuretic Eczema Emetic Febrifuge PurgativeStemless carline thistle is seldom used in modern herbalism. The plant was at one time in great demand as an aphrodisiac[7], it is occasionally used nowadays in the treatment of spasms of the digestive tract, gall bladder and liver disorders, dropsy, urine retention etc[9, 268]. The root has also been used in treating a range of skin complaints such as acne and eczema[268]. A decoction of the root can be used externally to cleanse wounds or as an antiseptic gargle[268]. Some caution should be employed since in large doses the root is purgative and emetic[268]. The root is antibiotic, antispasmodic, carminative, diaphoretic, digestive, mildly diuretic, emetic in large doses, febrifuge and purgative in large doses[7, 9, 21, 46]. The root is harvested in the autumn and dried for later use[7].

propta Seed - surface sow in a cold frame in the spring. The seed usually germinates in 4 - 8 weeks at 15°c[138]. As soon as they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer.

nwatta Succeeds in a sunny position in ordinary garden soil[[11]. Prefers a neutral to alkaline soil[138, 238]. Prefers a poor soil[200]. Established plants are drought tolerant[190]. Plants are hardy to about -20°c[187]. The stemless carline thistle is a protected plant in the wild because of its rarity[7]. This species resents root disturbance, it should be planted into its final position as soon as possible[138]. Plants are usually short-lived or monocarpic[187]. The plant is popular in dried flower arranging, the dried heads keeping their appearance indefinitely[7].

#### 5.2.605 Epimedium grandiflorum

Barrenwort, Bishop's Hat, Longspur Epimedium

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.4 m hkuc hmim cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikl hpa7tmwatli dyatxre7t hjonli

drutta Epimedium grandiflorum is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant and young leaves - cooked[105, 179]. Soaked and then boiled[177]. (This suggests that the leaves are bitter and need to be soaked in order to remove the bitterness.)

tcanta A good ground cover plant[200].

dwatta Antiasthmatic Antibacterial Antirheumatic Antitussive Aphrodisiac Hypoglycaemic Tonic VasodilatorThe aerial parts of the plant are antiasthmatic, antibacterial, antirheumatic, antitussive, aphrodisiac, hypoglycaemic, tonic and vasodilator. Its use lowers blood sugar levels[116, 176]. It is used in the treatment of impotence, seminal emissions, lumbago, arthritis, numbness and weakness of the limbs, hypertension and chronic bronchitis[176]. It has an action on the genitals similar to the male sex hormone and can increase the weight of the prostate gland and seminal vesicle, it has increased copulation in animals and increases the secretion of semens[176]. The leaves are used as an aphrodisiac[218]. Administered orally, the leaf extract increases the frequency of copulation in animals[218].

propta Seed - best sown in a cold frame as soon as it is ripe in late summer[200, 280]. Sow stored seed as early as possible in the year in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the cold frame or greenhouse for at least their first winter[K]. Plant them out in mid to late summer[K]. Division, best carried out in August to September according to one report[280], in late spring according to another[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are root-

(loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires 12 weeks stratification at 5°c[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division just before growth starts in spring to single crowns[175]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Prefers a humus-rich fertile well-drained but moisture-retentive acid or neutral light sandy loam in partial shade[175, 200]. Prefers the dappled shade of a woodland garden but tolerates full sun if the soil is reliably moist throughout the growing season[200], flowering earlier in such a position. Plants require a sunnier position when growing in northern Britain[233]. This species is hardy to about -20°c, but if prolonged cold weather is not accompanied by snow cover the plants will appreciate a good mulch of organic matter[187]. A very ornamental plant[233]. Plants are very susceptible to attacks by slugs[175].

#### 5.2.692 Rhododendron mucronulatum

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Rhododendron mucronulatum is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flower petals - raw[105]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. Hardy to about -25°c[184]. A very ornamental plant[1]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.693 Pycnanthemum muticum

Cluster Mountain Mint

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Pycnanthemum muticum is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves have a pleasant mint-like aroma and flavour and can be used to make a refreshing tea[183]. They can also be used as a mint substitute in cooking[238].

tcanta None known

dwatta None known

propta Seed - sown spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If there are sufficient seeds they can be sown in an outdoor seedbed in April. Division in spring.

nwatta Succeeds in most soils[1] but prefers a rich loamy soil in full sun or partial shade with plenty of moisture in the growing season[200]. Hardy to at least -15°c[200]. The bruised leaves are very aromatic[200].

#### 5.2.694 Conium maculatum

Hemlock, Poison hemlock

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyfjxre7t hjonli

drutta Conium maculatum is a BIENNIAL growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105]. Although toxic, plants found in the south of England are comparatively harmless and the leaves are used as a pot-herb[2]. They can also be dried for later use. The toxic principle is said to be destroyed by thorough cooking or drying[4, 100]. Caution is advised, especially on the remarks about plants in southern England[K]. See the notes above on toxicity.

tcanta None known

dwatta Analgesic Antirheumatic Antispasmodic Cancer Emetic Epilepsy Galactofuge Homeopathy SedativeHemlock is a very poisonous plant that has a long history of medicinal use, though it is very rarely used in modern herbalism[238, 254]. It is a narcotic plant that sedates and relieves pain[238]. The plant contains conine, an extremely toxic substance that can also cause congenital defects[254]. The whole plant is analgesic, antispasmodic, emetic, galactofuge and sedative[4, 7, 9, 21, 213, 222]. It is a traditional folk treatment for cancer[222] and was formerly widely used internally in very small doses to treat a variety of complaints including tumours, epilepsy, whooping cough, rabies and as an antidote to strychnine poisoning[232, 254]. It is still used externally, usually in ointments and oils, in the treatment of mastitis, malignant tumours (especially breast cancer) anal fissure and haemorrhoids[238]. The leaves and stems should be harvested when the first fruits are forming, since they are then at their most active medicinally[4]. The fruits are gathered either when fully ripe, or before they turn from green to yellow, and are then dried[4]. Because of the extremely toxic nature of this herb, it is seldom employed nowadays[232]. Use with extreme caution and only under the guidance of a qualified practitioner[21, 238]. See also the notes above on toxicity. A homeopathic remedy is prepared from a tincture of the fresh plant, harvested when in flower[232]. It is used

into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years[78].

nwatta Tolerates most soils except those that are waterlogged[200]. Prefers a cold damp spoil[1]. Seldom fruits well in Britain[11, 182], the seed only matures in reasonable summers[1]. Most of the plants that have been supplied under this name in Britain this century are in fact *Ilex collina*[200]. Dioecious, male and female plants must be grown if seed is required.

## 5.2.688 Rhamnus japonica

Japanese buckthorn

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta *Rhamnus japonica* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves[105, 177]. No more details but some caution is advised, see the notes above on toxicity.

tcanta Dye WoodA green dye is obtained from the branches[178]. Wood - close grained. Used for furniture[46, 61].

dwatta Emetic Febrifuge Laxative SkinFebrifuge, laxative, skin[46, 61, 178]. The fruit and the bark are emetic and laxative[218].

propta Seed - best sown in the autumn in a cold frame. Stored seed will require 1 - 2 months cold stratification at about 5° and should be sown as early in the year as possible in a cold frame or outdoor seedbed[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta Succeeds in any reasonably good soil[11]. A polymorphic species[58]. The species in this genus are notably resistant to honey fungus[200].

## 5.2.689 Polystichum munitum

Giant Holly Fern, Western swordfern

4 tlin 8 cyuc 1 kcak 0 tcan 2 dwat m hkuc  
pcimhmim cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliw  
hpa7tmwatli hjonli

drutta *Polystichum munitum* is an evergreen Fern growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - roasted[2, 105, 118, 161]. Peeled and then baked like potatoes[213]. The roots were generally viewed by the native North American Indians mainly as a famine food for use when little else was available[256]. The roots were generally harvested in the spring, before the plant came into growth then cooked and peeled before being eaten[256].

tcanta Hair LiningThe leaves are used for lining boxes, baskets, fruit drying racks etc and as a stuffing material in bedding[99, 118, 257]. A decoction of the rhizome treats dandruff[172]. Plants can be grown as a ground cover and are best spaced about 1 metre apart each way[208].

dwatta Antidandruff Birthing aid PoulticeAn infusion of the fronds has been used as a wash or poultice to treat boils and sores[213, 257]. The young shoots have been chewed and eaten as a treatment for cancer of the womb and to

treat sore throats and tonsillitis[257]. The leaves have been chewed by women to facilitate childbirth[257]. The sporangia have been crushed and applied as a poultice to burns, sores and boils[213, 257]. A decoction of the rhizomes has been used in the treatment of dandruff[213, 257].

propta Spores - best sown as soon as they are ripe, though they can also be sown in the spring. Sow them on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division. This is best done in the spring.

nwatta Very hardy and easily grown in light shade in any reasonable soil[187]. Prefers a sandy humus-rich soil in a shady position that is moist even in winter[1]. Tolerates part sun for up to 6 hours a day if the soil remains moist[200]. It is possible that the var. imbricans will succeed in drier soils[K]. Prefers a pH in the range 6.5 to 7.5[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental plant[1], it is a robust clump-forming species[187]. Remove old fronds from the plant in the spring because they may harbour fungal diseases[200].

## 5.2.690 Clethra barbinervis

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflatprik  
hpa7tmwatli xre7t hjonli

drutta *Clethra barbinervis* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[46, 61, 105, 179]. Eaten with rice dishes[177].

tcanta None known

dwatta None known

propta Seed - sow early spring in a greenhouse[113]. Only just cover the seed and keep the pot moist. Germination usually takes place within 1 - 3 months at 13°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out once they are more than 20cm tall in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[11, 113]. Very easy[113]. Root cuttings in December/January[113]. Suckers in the dormant season[113]. They can be planted out direct into their permanent positions if required. Layering of current years growth in late autumn. Takes 18 months. Can also be done in early spring[200].

nwatta Requires a moist well-drained lime-free peaty soil[1, 11, 184] succeeding in a sunny position or partial shade[164]. Plants are hardy to about -20°C according to one report[184], this conflicts with another report that says it only succeeds outdoors in Britain from Sussex and westwards[11]. A third report says that the plant is generally hardy but sometimes fails in very cold districts of Britain[182]. The new growth in spring is very susceptible to damage by late frosts[49]. The flowers are fragrant[245]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.691 Tricyrtis macropoda

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta *Tricyrtis macropoda* is a PERENNIAL growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium

ing well. Plant them out in the spring. Cuttings in late summer[200].

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden, Woodland garden. Succeeds in any fertile humus-rich soil[200], preferring a moist but well-drained peaty loam[1, 280]. Requires a lime-free soil[280]. Grows best in the light dappled shade of a woodland[200, 280]. Plants can succeed in the dry shade of trees[233]. A shallow-rooting plant, the rhizomes creeping just below the soil and the finer roots occupying the top 30cm of the soil[280]. A clump-forming species, the rhizomes making only short new growth each year, it needs to be divided every 3 - 4 years in order to maintain vigour[280]. Plants are hardy to about -20°C[187], though the flowers in spring can be damaged by late frosts[233]. A very ornamental plant[1], there are several named varieties[187]. It grows well in the rock garden or wild garden[1]. Plants are self-sterile and so more than one clone is required for cross-fertilization in order for seed to be produced. Plants will often hybridise with other species growing nearby[280]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, Naturalizing.

## 5.2.606 Orchis coriophora

Bug Orchis

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta *Orchis coriophora* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: DrinkRoot - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Antifatulent Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from

which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Easily grown in full sun in a moist sandy loam[42]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. Plants can succeed in a lawn in various parts of the country. The lawn should not be mown early in the year before or immediately after flowering[200]. Plant out bulbs whilst the plant is dormant, preferably in the autumn[200]. Plants seem to be immune to the predations of rabbits[233]. Cultivated plants are very susceptible to the predation of slugs and snails[230]. The flowers have an abominable bug-like smell[42, 230]. The flowers of the commoner sub-species, *O. coriophora* fragrans, however, are sweetly scented[230].

## 5.2.607 Disporum trachycarpum

Fairybells

4 tlin 8 cyuc 2 kcak 0 tcan 1 dwat 0.5 m hkuc  
pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta *Disporum trachycarpum* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 161, 177, 257]. A sweet flavour[212]. The fruit is up to 10mm in diameter and is leathery rather than pulpy[235].

tcanta None known

dwatta Ophthalmic PoulticeThe seed has been used to clear foreign objects from the eye. A fresh seed was inserted and the eye closed then rubbed until the seed was watered out with the foreign object clinging to it[257]. The seeds were also placed in the eye overnight and an infusion of the bark used as an eyewash to treat snow-blindness[257]. An infusion of the leaves has been used as a wash for wounds whilst a poultice of the dampened bruised leaves has been applied to bleeding wounds[257].

propta Seed - best sown in a cold frame as soon as it is ripe[175]. Use a lime-free compost and keep it moist[175]. Stored seed requires 6 weeks cold stratification and should be sown as early in the year as possible[175]. Germination usually takes place within 3 - 6 months or more at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200].

nwatta Best grown in partial shade in a moist peaty or woodland soil[1, 175]. A very hardy plant, tolerating temperatures down to about -20°C[187]. Plants spread well by means of creeping rhizomes when they are grown in a leafy soil[187]. This species is closely related to *D. smithii*[233].

## 5.2.608 Lilium concolor

Morning Star Lily

4 tlin 8 cyuc 2 kcak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw  
hpa7tmwatli xre7t hjonli

drutta *Lilium concolor* is a BULB growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is

hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers **Leaves** **Root****Edible Uses:** Bulb - cooked[2, 105]. The bulb is up to 35mm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*). Young leaves - cooked[177]. Flowers[178]. No more details are given.

**tcanta** None known

**dwatta** **Carminative** **Expectorant** **Pectoral** **Poultice** **Sedative** **Tonic**The bulb is carminative, expectorant, pectoral, sedative and tonic[147, 218]. It is taken internally in the treatment of bronchial complaints[238]. The flowers invigorate the blood[218]. They are poulticed onto sores and boils[218].

**propta** **Seed** - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

**nwatta** **Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun**[143, 200]. **Prefers an acid sandy soil but also succeeds on heavy soils**[47, 143]. Plants are lime tolerant[47, 143, 200]. Requires a sheltered position if grown outdoors, doing well on a rock garden, but it is best grown in a greenhouse[163] **Stem** rooting, the bulbs should be planted 7 - 10 cm deep[143, 200]. **Early to mid autumn** is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1], it is cultivated for its edible bulb in Japan[2]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 5.2.609 Allium flavum

Small Yellow Onion, Ornamental Onion

4 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** **Allium flavum** is a **BULB** growing to 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers **Leaves** **Root****Edible Uses:** Bulb - raw or cooked. The bulb is rather small, about 15mm tall and 10mm in diameter[203]. **Leaves** - raw or cooked. **Flowers** - raw.

**tcanta** **Insecticide** **Repellent**The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

**dwatta** **Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system**[K].

**propta** **Seed** - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division of the bulbs in late summer or the autumn. Larger bulbs can be planted straight out into their permanent positions, though it might be best to pot up the smaller bulbs and grow them on for a year before planting them out..

**nwatta** **Landscape Uses:** **Border.** A very easily grown plant, it prefers a sunny position in a light well-drained soil[1, 203]. It succeeds in clay soils and also in areas of higher rainfall, so long as the soil drains fairly well[203]. A very variable species with forms ranging in height from 8 - 50cm[203]. Closely related to *A. carinatum*[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. **Special Features:** Not North American native, Naturalizing, Suitable for cut flowers, Suitable for dried flowers.

## 5.2.610 Polygonatum odoratum

Solomon's Seal

4 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.9 m hkuc pcmhmm cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

**drutta** **Polygonatum odoratum** is a **PERENNIAL** growing to 0.9 m (3ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

**kcakta Edible Parts:** Leaves **Root****Edible Uses:** Young shoots - cooked. They can be used as an asparagus substitute[46, 55, 61]. **Root** - cooked[2, 55, 105, 179]. **Rich in starch.**

**tcanta** **Miscellany**None known

**dwatta** **Antiperiodic** **Antitussive** **Cardiotonic** **Demulcent** **Diuretic** **Hypoglycaemic** **Miscellany** **Ophthalmic** **Resolvent** **Sedative** **Tonic**Solomon's seal has been used for thousands of years in herbal medicine. It is used mainly in the form of a poultice and is believed to prevent excessive bruising and to stimulate tissue repair[254]. The root is antiperiodic, antitussive, cardiotonic, demulcent, diuretic, energizer, hypoglycaemic, ophthalmic, resolvent, sedative and tonic[7, 9, 21, 147, 174, 176, 178, 218]. It is used in the treatment of, dry throat, dry coughs and coronary heart disease[176]. The plant is only used in domestic medicine[9]. An infusion is used as a diuretic and stimulant to the metabolism, though no more than 3 cups per day should be taken and only over short periods[9]. It can also be applied externally as a poultice to treat bruises, small wounds etc[7, 9]. It has also been used to remove freckles[9, 21, 174, 176, 178]. The root is harvested in the autumn and can be dried for later use[9]. It should not be used internally except under expert supervision[254].

**propta** **Seed** - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late

**kcakta Edible Parts:** Leaves**Edible Uses:** Young leaves - cooked. Not very palatable[172].

**tcanta** **Hair** **Mordant**The root can be used as an alum substitute, this is a mordant used in fixing dyes[168, 172]. The root is rich in tannin, is this the active ingredient that acts as a mordant?[172]. A good ground cover plant for the woodland garden[200]. Plants should be spaced about 30cm apart each way[208].

**dwatta** **Antiphlogistic** **Antiseptic** **Astringent** **Febrifuge** **Ophthalmic** **Poultice**The root is antiphlogistic, antiseptic, astringent, febrifuge and ophthalmic[94, 172].

**propta** **Seed** - sow early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. Division in March or October[1, 111]. It is best to divide the plants in August or early September, making sure that the woody roots are planted quite deeply with only the crown of foliage above the ground[233].

**nwatta** **Succeeds in any good sweet garden soil that does not dry out in spring**[1]. **Prefers full sun but tolerates partial shade**[1, 111]. **Prefers a well-drained fairly rich and not too heavy soil**[111]. Plants are hardy to about -15°C[187]. Apt to hybridize with other members of this genus[111]. This species is probably best treated as a sub-species of *H. mirantha*.

## 5.2.685 Tamus communis

Black Bryony

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 3.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

**drutta** **Tamus communis** is a **PERENNIAL CLIMBER** growing to 3.5 m (11ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to July, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, flies. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Leaves**Edible Uses:** Young shoots - cooked[2, 4, 61, 65]. A decidedly bitter flavour[7]. An asparagus substitute, it is best if the water is changed once whilst cooking[115]. See notes at top of the page regarding possible toxicity.

**tcanta** **None** known

**dwatta** **Antieccymotic** **Antirheumatic** **Cathartic** **Diuretic** **Emetic** **Haemolytic** **Poultice** **Rubefacient**The root is antieccymotic, diuretic, emetic, haemolytic and rubefacient[4, 7, 9]. Use with caution, the plant is rich in saponins, has a very powerful cathartic affect and ranks as a dangerous irritant poison[4, 7]. It is not normally used internally, but the macerated root is applied externally as a poultice to bruises, rheumatic joints etc[4, 7]. This should not be done without expert advice since it can cause painful blisters[9]. The root is used fresh[9] or can be harvested in the autumn and dried for later use[7].

**propta** **Seed** - sow in a cold frame in early spring or as soon as the seed is ripe in the autumn. Prick out the seedlings into individual pots once they are large enough to handle, and plant out in the summer or in late spring of the following year.

**nwatta** **Requires a moist well-drained fertile soil**[17]. A climbing plant, the weak stems support themselves by twining around other plants and are capable of growing quite high up into shrubs and trees[4]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.686 Holodiscus discolor

Creambush, Oceanspray

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta** **Holodiscus discolor** is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[106, 177, 183]. **Small** and dry[161, 183].

**tcanta** **Wood****Wood** - very hard. Used for making small tools, roasting tongs etc[118]. It does not burn easily[118].

**dwatta** **Blood** **purifier** **Ophthalmic** **Poultice** **Skin** **Tonic** The seeds are a blood purifier[257]. An infusion has been used in the treatment of smallpox, black measles and chickenpox[257]. The blossoms have been used in the treatment of diarrhoea[257]. The inner bark is tonic[257]. An infusion has been used as an eyewash[257]. The bark can be dried, powdered and then used with oil as a dressing on burns[257]. A poultice of the leaves has been applied to sore lips and sore feet[257]. A powder of the dried leaves has been used as a dressing on sores[257]. A decoction of the leaves has been used in the treatment of influenza[257].

**propta** **The seed** requires 4 months stratification at 4°C. It is best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood with a heel, July/August in a frame. Can be difficult[200]. Layering in spring. Easy[200].

**nwatta** **Succeeds in a good loamy soil that does not become too dry in summer, in full sun or light shade**[200]. A fast-growing plant[188], it thrives in thin woodland[11]. A very ornamental plant[1, 11], when fully dormant it is hardy to about -15°C[200], though the young growth in spring can be damaged by late frosts[K]. The flowers emit a perfume similar to meadowsweet[245].

## 5.2.687 Nemopanthus mucronatus

Mountain Hilly

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

**drutta** **Nemopanthus mucronatus** is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit[105, 161]. Quite bitter[257].

**tcanta** **None** known

**dwatta** **Diuretic** **Tonic**The root is diuretic[257]. An infusion of the grated root is used in the treatment of grave[257]. A decoction of the small branches, reduced to a syrup, has been used as a tonic[257].

**propta** **Seed** - best sown as soon as it is ripe in a cold frame. The seed can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out

be planted out direct into their permanent positions. Leaf bud cuttings of the current seasons growth in a frame[200].

nwatta Landscape Uses:Border, Foundation, Massing, Specimen. Tolerates most soils[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Requires partial shade[11]. Does well on very acid soils with a pH around 4.5[200]. In frosty areas it is best to site the plant in a position shaded from the early morning sun[238]. A good bee plant[108]. The flowers are sweetly scented[245]. Plants are best left unpruned[49]. Another report says that the previous year's flowering shoots should be cut back in early spring[238]. This species is notably susceptible to honey fungus[200]. Special Features:North American native, Suitable for cut flowers, Suitable for dried flowers, Blooms are very showy.

## 5.2.681 Ranunculus aquatilis

Water Crowfoot, White water crowfoot

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcuphja7nhs6t hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta Ranunculus aquatilis is a ANNUAL/PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcaakta Edible Parts: LeavesEdible Uses: The entire plant has been boiled and eaten[257]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Antiasthmatic Antirheumatic FebrifugeThe subspecies *R. aquatilis capillaceus* is used in India in the treatment of intermittent fevers, rheumatism and asthma[240].

propta Seed - sow spring in a tray of water in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta A plant of boggy soils and shallow water, it prefers a loamy soil and a sunny position. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.682 Taraxacum megalorrhizon

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta Taraxacum megalorrhizon is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Coffee TeaLeaves - raw or cooked. The following uses are also probably applicable to this species, though we have no records for them[K] Root - cooked[183]. Flowers - raw or cooked[183]. The unopened flower buds can be used in fritters[183]. The whole plant is dried and used as a tea[177, 183]. A pleasant tea is made from the flowers. The leaves and the roots can also be used to make tea. The root is dried and roasted to make a coffee substitute.

tcanta LatexA latex obtained from the roots is used to make a high-class rubber[61, 110].

dwatta None known

propta Seed - sow spring in a cold frame and either surface-sow or only just cover the seed. Make sure the compost does not dry out. Germination should take place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle, choosing relatively deep pots to accommodate the tap root. Plant them out in early summer. Division in early spring as the plant comes into growth.

nwatta Prefers a well-drained humus-rich soil in full sun or light shade. According to one report this species reproduces apomictically and sexually[50], whilst another report says that only apomictic seed production is undergone[110]. Apomixis is an asexual method of seed production where each seed is genetically identical to the parent plant. Occasionally seed is produced sexually, the resulting seedlings are somewhat different to the parent plants and if these plants are sufficiently distinct from the parents and then produce apomictic seedlings these seedlings are, in theory at least, a new species.

## 5.2.683 Euphorbia marginata

Mountain Snow, Ghost Spurge, Ghost Weed

4 tin 8 cyuc 1 kcaak 3 tcan 1 dwat m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Euphorbia marginata is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: GumA latex from the plant is used for chewing[61, 177, 257]. Caution is advised, see the notes on toxicity above.

tcanta GumLandscape Uses: Border, Container, Specimen. A very ornamental plant, its long-lasting flowers are used in button holes[1]. Hybridizes with other members of this genus[200]. This genus has been singled out as a potential source of latex (for making rubber) for the temperate zone, although no individual species has been singled out[141]. Special Features: Attractive foliage, North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands plant. Dynamic accumulator.

dwatta Astringent Galactogogue Salve Women's complaintsAstringent, women's complaints. Used in the treatment of leucorrhoea[4]. An infusion of the crushed leaves has been used as a liniment in the treatment of swellings[257]. An infusion of the plant has been used to increase milk flow in nursing mothers[257]. Any medicinal use of this plant should be carried out with great care, see the notes above on toxicity[257].

propta Seed - sow spring in situ. Germination usually takes place within 2 - 3 weeks at 20°C.

nwatta Prefers a light well-drained moderately rich loam in an open position[200]. Succeeds in dry soils[1]. The ripe seed is released explosively from the seed capsules[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 5.2.684 Heuchera micrantha

Alum Root, Crevice alumroot

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Heuchera micrantha is an evergreen Perennial growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

spring or early summer.

nwatta Landscape Uses:Container, Massing, Specimen, Woodland garden. Prefers a fertile humus rich moisture retentive well-drained soil in cool shade or semi-shade[200]. Plants are intolerant of heat and drought but tolerate most other conditions[200]. Prefers a dryish soil[10, 19]. Does well in woodlands and copses[1, 19]. Hardy to about -25°C[187]. The rhizomes are long and creeping, the plant forming large colonies[187]. The flowers are sweetly scented[245]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs[K]. Hybridizes with other members of this genus[200]. A number of named forms have been selected for their ornamental value[187]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers, Fragrant flowers.

## 5.2.611 Thymus pulegioides

Broad-Leaved Thyme, lemon thyme

4 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Thymus pulegioides is an evergreen Shrub growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: CondimentThe leaves of some cultivars can be used as a condiment[183, 238]. They can be used as an ingredient of the herb mix 'bouquet garni', or added to soups, vegetables etc, going particularly well with mushrooms or courgettes[238]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant Disinfectant Expectorant-The leaves, and especially the essential oil contained in them, are antiseptic, deodorant, disinfectant and expectorant[200, 222, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Grows well between stepping stones on paths, tolerating light treading[183, 200]. Succeeds on walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to at least -10°C[238]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200]. There are many named forms selected for their ornamental value[183]. The leaves are highly aromatic[200]. The flowers are rich in nectar and are very attractive to honey bees[200].

## 5.2.612 Calypso bulbosa

Fairy slipper

4 tin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.1 m hkuc pcmhmim cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Calypso bulbosa is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from October to July, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[22, 46, 61, 105, 155]. Rather small[161]. The roots have a rich, butter-like quality[256]. They were usually boiled by the North American Indians before being eaten, though young maidens would eat them raw as they were believed to increase the size of the bust[256].

tcanta None known

dwatta Antispasmodic EpilepsyThe bulbs have been chewed or the flowers sucked in the treatment of mild epilepsy[257].

propta Seed - we have no information on this species but, like all members of the orchid family, the seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. Surface sow the seed, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division in autumn. Make sure that you keep plenty of soil with each plant. It is also said to be possible to transplant orchids after they have flowered but whilst they are still in leaf. Grow on for at least the first year before potting up and do not plant out until the plants are 2 - 4 years old. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Grows well in half shade in a light moist organic-rich soil[1, 42, 200]. Requires a lime-free soil, doing best in full shade[42]. The plant comes into growth in the autumn and, although fairly hardy, is best grown in a frame or unheated greenhouse[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. Plants can be naturalized in the woodland or bog garden[200]. Apply a good organic mulch in the winter[1]. Plants do not always grow every year, the bulb can remain dormant in the soil for 2 years[42].

## 5.2.613 Polygonum arenastrum

Small-Leaved Knotweed, Oval-leaf knotweed

4 tin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Polygonum arenastrum is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Young leaves and plants - raw or cooked[105, 177]. Used as a potherb[183], they are very rich in zinc[179]. A nutritional analysis is available[218]. Seed - rich or cooked. Rather small and fiddly to utilize, they can be used in all the ways that buckwheat (*Fagopyrum esculentum*) is used, either whole or dried and ground into a powder for use in pancakes, biscuits and piñole[4, 55, 106, 161, 183]. The leaves are a tea substitute[183].

tcanta Yields a blue dye that is not much inferior to indigo[115]. The part used is not specified, but it is likely to be the leaves. Yellow and green dyes are obtained from the whole plant[168]. The roots contain tannins, but the quantity was not given[223].

dwatta DysenteryKnotweed is a safe and effective astringent and diuretic herb that is used mainly in the treatment of complaints such as dysentery and haemorrhoids. It is also taken in the treatment of pulmonary complaints because the silicic acid it contains strengthens connective tissue in the lungs[254]. The whole plant is anthelmintic, astringent, cardiotoxic, cholagogue, diuretic, febrifuge, haemostatic, lithontronic and vulnerary[4, 7, 9, 21, 53, 147, 172, 176, 178]. It was formerly widely used as an astringent both internally and externally in the treatment of wounds, bleeding, piles and diarrhoea[4]. Its diuretic properties make it useful in removing stones[4]. An alcohol-based preparation has been used with success to treat varicose veins of recent origin[7]. The plant is harvested in the summer and early autumn and is dried for later use[9]. The leaves are anthelmintic, diuretic and emollient[218]. The whole plant is anthelmintic, antiphotic and diuretic[218]. The juice of the plant is weakly diuretic, expectorant and vasoconstrictor[218]. Applied externally, it is an excellent remedy to stay bleeding of the nose and to treat sores[4]. The seeds are emetic and purgative[4, 240]. Recent research has shown that the plant is a useful medicine for bacterial dysentery. Of 108 people with this disease, 104 recovered within 5 days when treated internally with a paste of knotweed[254].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment, in good soils the plant will cover an area up to a metre in diameter[1, 4]. Prefers an acid soil[20]. Dislikes shade. Knotweed is a common and invasive weed of cultivated ground[7]. It is an important food plant for the caterpillars of many species of butterflies[30]. It also produces an abundance of seeds and these are a favourite food for many species of birds[4]. Plants seem to be immune to the predations of rabbits[233]. The flowers have little or no scent or honey and are rarely visited by pollinating insects. Self-fertilization is the usual method of reproduction, though cross-fertilization by insects does sometimes occur[4]. The plant also produces cleistogamous flowers - these never open and therefore are always self-fertilized[4]. The plant is very variable according to habitat and is seen by most botanists as part of an aggregate species of 4 very variable species, viz. - *P. aviculare*. *L.*; *P. boreale*. (Lange.)*Small*; *P. rivivacuum*. *Jord. ex Box.*; and *P. arenastrum*. *Bor*[17].

## 5.2.614 *Lycopus virginicus*

Bugleweed, Virginia water horehound  
4 tin 8 cyuc 2 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli  
drutta *Lycopus virginicus* is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[46, 61].

tcanta None known  
dwatta Antianxiety Antidandruff Astringent Cardiac Hypoglycaemic Narcotic SedativeBugleweed has sedative properties and is used in modern herbalism principally to treat an overactive thyroid gland and the racing heartbeat that often accompanies this condition[254]. The whole plant is used as an astringent, hypoglycaemic, mild narcotic and mild sedative[4, 102, 222, 238]. It also slows and strengthens heart contractions[238]. The plant has been shown to be of value in the treatment of hyperthyroidism[222, 238], it is also used in the treatment of coughs, bleeding from the lungs and consumption, excessive menstruation etc[4, 238]. It should not be prescribed for pregnant women or patients with hypothyroidism[238]. The plant is harvested as flowering begins and can be used fresh or dried, in an infusion or as a tincture[4, 238]. The root has been chewed, a portion swallowed and the rest applied externally in the treatment of snakebites[257]. Current uses are predominantly for increased activity of the thyroid gland and for premenstrual syndrome symptoms such as breast pain [301]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Lycopus* for nervousness and premenstrual syndrome (see [302] for critics of commission E).

propta Seed - sow spring or autumn in a cold frame[238]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring or autumn[238]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Tolerates most soil types so long as they are wet. Succeeds in full sun or in partial shade[238], in damp meadows or in wet places by ponds or streams[200].

## 5.2.615 *Chrysosplenium alternifolium*

Golden Saxifrage, Alternate-leaf golden saxifrage, Iowa golden saxifrage  
4 tin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli fyifxre7t hjonli

drutta *Chrysosplenium alternifolium* is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw[2, 46, 61, 66, 105, 177]. Added to salads[183]. The leaves are rather small, and there is a distinct bitterness in the flavour, especially during hot weather[K].

tcanta The plants creeping habit makes it a good ground cover for the bog garden[200].

dwatta None known

propta Seed - sow spring or autumn in a lightly shaded position in a cold frame. Stand the pot in 2cm of water. When they are large enough to handle, prick the seedlings out into

plant is demulcent, diuretic and tonic[218]. It is also used as a tonic to correct broken bones and tendons[218].

propta Seed - sow spring in a cold frame in a free draining compost and only just cover. The seed usually germinates in 1 - 3 months at 15°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring whilst dormant[200].

nwatta Easily grown in ordinary garden soil in a sunny position, but plants are apt to become invasive[1, 200]. Nearly all taxa in *Calystegia* intergrade geographically into neighboring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically[266].

## 5.2.678 *Salix commutata*

undergreen willow  
4 tin 8 cyuc 1 kcaak 3 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix commutata* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172].

tcanta Soil reclamationA pioneer plant for difficult sites[200]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.679 *Pyrularia pubera*

Oil Nut, Buffalo nut  
4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 3.5 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Pyrularia pubera* is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy)

and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit[2, 46, 61]. Caution is advised since the fruit is said to be permeated with an acrid oil[1, 43]. The pear-shaped fruit is about 25mm long[200]. An edible oil is obtained from the seed[105]. Is this different from the acrid poisonous oil of the fruit?[K]

tcanta OilNone known

dwatta Emetic SalveThe plant has been used as a salve on old sores[257]. The seed has been chewed to cause vomiting in the treatment of colic[257].

propta Seed - best sown in a cold frame as soon as it is ripe into a pot containing a small host tree. Stored seed will require 3 months cold stratification before it is sown[200]. Grow on in a cold frame until the plant is large enough to plant out and then plant it close to a mature host tree. Remove the small host tree once the plant is well established[200].

nwatta Parasitic on the roots of a range of trees and shrubs, but most commonly *Tsuga carolina*, this plant needs to grow close to a host tree. It requires a well-drained but moisture retentive lime-free soil[200].

## 5.2.680 *Hydrangea arborescens*

Seven Barks, Wild hydrangea, Ashy Hydrangea, Snowhill Hydrangea, Smooth Hydrangea  
4 tin 9 cyuc 1 kcaak 0 tcan 3 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli xre7t hjonli

drutta *Hydrangea arborescens* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: The peeled branches and twigs have been used to make a tea[257]. The new growth of young twigs has been peeled, boiled thoroughly then fried and eaten[257].

tcanta None known

dwatta Anthelmintic Cathartic Diaphoretic Sialagogue TonicSeven barks was used by the North American Indians as a remedy for kidney and bladder stones and is still used for these purposes in modern herbalism[254]. It is considered to both encourage the expulsion of stones and to help dissolve those that remain[254]. The roots are anthelmintic, cathartic, diaphoretic, diuretic, emetic and tonic[4, 21, 46, 165, 222, 238]. They are used in the treatment of kidney stones, mucous irritations of the bladder, cystitis, nephritis, enlarged prostate and bronchial affections[222, 238, 254]. Excessive doses can cause dizziness and bronchial congestion[238]. The fresh roots are very succulent and can be easily cut, when dry they become very tough and resistant[4]. They are harvested in the autumn and it is best to cut them into short sections before drying them[4, 254]. The scraped bark is used as a poultice on wounds, burns, sore muscles, sprains etc[222]. The bark is chewed in the treatment of stomach and heart ailments[222]. The leaves are cathartic, diuretic, sialagogue and tonic[4].

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Thicker growths make the best cuttings, but these should be placed in individual pots[78]. Good percentage[113]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Division of suckers in late winter[113]. They can



into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood with a heel, July/August in a frame. Can be difficult[200]. Layering in spring. Easy[200].

nwatta Succeeds in a good loamy soil that does not become too dry in summer[1] in full sun or light shade[200]. Plants are hardy to about -15c[200].

## 5.2.674 Symplocos paniculata

Asiatic Sweetleaf, Sapphire-berry  
4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli dyatxre7t hjonli

drutta Symplocos paniculata is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - cooked[177]. Used in jams, jellies and sauce[183]. The fruit is about 8mm in diameter[200].

tcanta Dye Mordant WoodA yellow or red dye is obtained from the leaves and bark[51, 146, 158, 272]. We have no specific information for this species but many species in this genus contain alum and can be used as mordants when dyeing[168]. Wood - white, soft to moderately hard. close grained, liable to twist and split when seasoning. Of possible use in turnery[146, 158].

dwatta Astringent Ophthalmic TonicThe bark is astringent, cooling and tonic[240]. It is useful in the treatment of menorrhagia, bowel complaints, eye diseases and ulcers[240]. It is also used as a gargle for giving firmness to spongy and bleeding gums[240]. The juice of the bark is applied externally to sprains and muscular swellings[272].

propta Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires stratification and is best sown in a cold frame in late winter, it can take 12 months to germinate[11]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a cold frame[78, 200]. Roots are formed in about 4 weeks. Good percentage[78].

nwatta Requires an acid soil and a sunny position. Succeeds in a sunny position in any well-drained fertile neutral to acid soil[182, 200]. One report says that plants are hardy to about -10°C, though it is also said that they can survive quite harsh winters outdoors in Britain but that they need a warm, sunny protected position and a hot summer if they are to fruit well[11, 200]. The fruits are sometimes spoiled by frosts[200]. The flowers are sweetly fragrant[200, 245]. Self-sterile, it needs cross-pollination with a different plant in the same species if seed and fruit are to be produced[11, 182]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.675 Pyrola minor

Wintergreen, Snowline wintergreen

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Pyrola minor is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit[5]. No more details are given. Leaves - raw[5, 52].

tcanta None known  
dwatta Antispasmodic Astringent Diuretic TonicThe plant is antispasmodic, astringent, diuretic and tonic[4, 172].  
propta Seed - the only information we have on this species is that it is difficult from seed and germinates infrequently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Pot up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary micorrhiza. Division with great care in the spring[1, 111]. Pot up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. This is a very ornamental[1] but difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1]. The flowers have a soft almond scent[245].

## 5.2.676 Silphium laeve

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Silphium laeve is a PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[2, 4, 105]. No more details are given in the reports.

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Division in spring[188]. This is very difficult due to the deep and extensive root system.

nwatta We have very little information on this species and do not know if it will be hardy in Britain. The following notes are based on the general needs of the genus. Succeeds in any ordinary garden soil[1]. Prefers a deep moisture retentive moderately fertile soil that is not too nitrogen rich, in sun or dappled shade[200]. Plants have a deep and extensive root system which makes transplanting difficult[200].

## 5.2.677 Calystegia pubescens

Japanese Bindweed

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Calystegia pubescens is a PERENNIAL CLIMBER growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[105, 177, 179]. Said to be purgative[179]. Young shoots - cooked[105, 177, 179].

tcanta None known  
dwatta Demulcent Diuretic Poulitice TonicThe flowers are diuretic, they are helpful in cases of diabetes[218]. The

individual pots and grow them on in a tray of water in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in light shade in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Succeeds in most soils if they are moist[200]. Requires a constantly wet but well-drained soil[200]. Prefers a shady position, succeeding in woodland[200].

## 5.2.616 Cardamine bulbosa

Bulbous Bittercress

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine bulbosa is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentLeaves - raw[105, 177]. Added to salads. The rootstock is grated and used as a condiment[207], it is a horse radish substitute[105, 177]. A hot pungent taste.

tcanta None known  
dwatta None known  
propta Seed - sow outdoors in a seedbed in a shady position in April. Plant out in autumn or spring. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 5.2.617 Aquilegia pubescens

Columbine, Sierra columbine

4 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Aquilegia pubescens is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K].

tcanta Parasiticide ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta Antispasmodic Diaphoretic Parasiticide Parasiticide Resolvent SalveAntispasmodic, diaphoretic, parasiticide, resolvent, salve[172].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored

seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Prefers a well-drained friable sandy loam with leaf mold[1]. Intolerant of heavy clay[200]. Most species of Aquilegia are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. This species is endemic to the southern Sierra Nevada, it sometimes forms extensive hybrid swarms with *A. formosa pauciflora* in the wild[71, 270]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.618 Cardamine scutata

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine scutata is a ANNUAL/BIENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[105, 177]. A hot peppery flavour.

tcanta None known  
dwatta None known  
propta Seed - sow spring or autumn in situ.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

## 5.2.619 Aster amellus

Ialian Aster

4 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.7 m hkuc  
htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Aster amellus is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from September to October, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants - cooked[177]. Only certain varieties (not specified in the report) are used[177]. A nutritional analysis is available[218].

tcanta None known  
dwatta Antiinflammatory Antitussive Depurative Haemostatic Malaria PectoralThe roots are anti-inflammatory, antitussive, depurative, haemostatic and pectoral[61, 147].They are used in the treatment of coughs, pulmonary affections and malaria[240]. The root juice is used internally in Nepal to treat indigestion and externally to treat boils[272].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. The seed usually germinates in 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots

and plant them out in the summer. Division in spring or autumn[200].

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Tolerates poorer soils[233]. Prefers a sunny position[200] but also succeeds in part shade[233]. Plants are hardy to about -25°c[187]. A very ornamental plant[1], there are some named varieties[233]. A polymorphic species[50], it hybridizes freely with other members of this genus[200]. Most species in this genus seem to be immune to the predations of rabbits[233].

### 5.2.620 Cardamine flexuosa

Wavy Bittercress,Woodland bittercress

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine flexuosa is a ANNUAL/PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to September, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[8, 52, 105, 183]. A hot cress-like flavour. Nice as a flavouring in salads, it is usually available all year round. Root - raw or cooked[183].

tcanta None known

dwatta None known

propta Seed - sow spring or autumn in situ. This species needs very little encouragement and is quite capable of sowing itself, often too freely.

nwatta Prefers a moist humus rich soil in shade or semi-shade[200] but it succeeds in most soils and positions[1]. A common garden weed, it is found especially in pot-grown plants[8].

### 5.2.621 Taraxacum albidum

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Taraxacum albidum is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Coffee TeaLeaves - raw or cooked[177, 183]. A rather bitter flavour, though it is a good tonic for the digestive system. Root - cooked[183]. Flowers - raw or cooked[183]. The unopened flower buds can be used in fritters[183]. The whole plant is dried and used as a tea[177, 183]. The root is dried and roasted to make a coffee substitute. A pleasant tea is made from the flowers. The leaves and the roots can also be used to make tea.

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame and either surface-sow or only just cover the seed. Make sure the compost does not dry out. Germination should take place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle, choosing relatively deep pots to accommodate the tap root. Plant them out in early summer. Division in early spring as the plant comes into growth.

nwatta Prefers a well-drained humus-rich soil in full sun or light shade. Isozyme analysis suggests that this species is uniclonal and of unique hybrid origin between T. japonicum and an unknown tetraploid species[275]. Many species in this genus produce their seed apomictically. This is an asexual method of seed production where each seed is genetically

identical to the parent plant. Occasionally seed is produced sexually, the resulting seedlings are somewhat different to the parent plants and if these plants are sufficiently distinct from the parents and then produce apomictic seedlings these seedlings are, in theory at least, a new species.

### 5.2.622 Onoclea sensibilis

Sensitive Fern

4 tlin 8 cyuc 2 kcaak 2 tcan 2 dwat 0.5 m hkuc pcmhmim cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Onoclea sensibilis is a deciduous Fern growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The seeds ripen from June to October. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: Leaves RootEdible Uses: The young uncurled leaves, often called 'fiddleheads', are used as a vegetable or eaten raw[159, 177, 183]. Remove the brown scales and then steam the leaves in very little water[213]. The young shoots have been sold as delicacies in Asian markets[213]. Root - cooked[105, 161, 177, 183]. A famine food, it is only used in times of scarcity[213].

tcanta HairA decoction of the plant has been used as a hair wash to help prevent baldness[257]. This species has a freely-running rootstock and makes an effective ground cover plant[200, 233]. Although it is deciduous its decomposing ferns make an effective weed suppressing mulch[200]. Plants should be spaced about 1 metre apart each way[208].

dwatta Galactogogue Poultrice Women's complaintsSensitive fern has not been much used medicinally. However, one native North American Indian tribe did employ it quite widely to treat various women's complaints[257]. An infusion of the root has been used to treat the pain following childbirth[257]. A decoction of the roots has been used to treat fertility in women, to give strength after childbirth, to treat the menses, and to treat swellings, cramps and a sore abdomen[257]. An infusion of the whole plant, or just the root, has been applied externally to full breasts where the milk will not flow[257]. A poultice of the plant is used in treating deep cuts[257].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep them in humid conditions until they are well established. Do not plant outside until the ferns are at least 2 years old. Division of underground rhizomes, October to March.

nwatta Landscape Uses:Container, Foundation, Specimen, Woodland garden. Prefers a moist light soil in partial shade[187]. Requires a damp humus-rich site in partial shade with preferably only 2 - 3 hours of sun daily[200]. Plants require an abundance of water at the roots all year round[1] and they grow well in a bog or woodland garden, or on the water's edge where they may grow out over the water[200]. Requires a pH in the range 5 - 6.5[200]. Plants can colonize most situations that are not too dry and are sheltered from harsh winds[200]. A very hardy plant, the rootstock can tolerate temperatures down to about -30°c[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. A very ornamental[1] and easily grown fern, spreading quite vigorously by means of a slender far-creeping rhizome when it is established[187]. It can become invasive in suitable conditions[200]. The fronds die quickly with the first autumn frosts[187], which is why the plant has gained its common name of the sensitive fern[200]. Special Features:Attractive foliage, North American native, Invasive, Naturalizing, Attracts butterflies. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Miscanthus sinensis is a PERENNIAL growing to 4 m (13ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: StemEdible Uses: Immature flowering spike[105, 177]. No further details are given.

tcanta BiomassBeing increasingly grown as a source of biomass, trials are currently (1992) taking place on its potential in Britain[K]. Plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover[200].

dwatta Anticoagulant Diuretic FebrifugeThe juice of young stems is used to disperse poisons, dissolve blood clots, dissipate extravasated blood and remove inflammation[218]. The plant is diuretic and refrigerant[147, 218].

propta Seed - surface sow in spring in a greenhouse and keep moist. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or early autumn[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Industrial Crop: Biomass Management: Hay Minor Global CropLandscape Uses:Border, Container, Foundation, Ground cover, Rock garden, Seashore, Specimen. Prefers a deep fertile loamy soil that does not dry out in summer[200] but succeeds in any ordinary soil that is not too dry[1, 162], in sun or light shade[200]. Fully dormant plants are hardy to about -20°c[187], though the young growth in spring can be damaged by late frosts. Often grown as an ornamental plant, there are many named varieties[162]. Many forms do not get enough summer heat to flower freely when they are grown in Britain, 'Silberfeder' (syn 'Silver Feather') is the most free-flowering in cooler climates[187]. Plants can be grown as a focal point in lawns, they also succeed in quite coarse grass[233]. The leaves have saw-toothed edges that can cut the unwary gardener, it is best to wear gloves when working with the plant[200]. Plants seem to be immune to the predations of rabbits[233]. Special Features: Attracts birds, Attractive foliage, Not North American native, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

### 5.2.672 Tamarix gallica

Manna Plant, French tamarisk

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc

htut cyutli kyuctcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwissliphsum hpa7tmwatli xre7t hjonli

drutta Tamarix gallica is a deciduous Shrub growing to 4 m (13ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: MannaEdible Uses: A manna is produced by the plants in response to insect damage to the stems[2, 105]. It is sweet and mucilaginous[105]. There is some confusion over whether the manna is produced by the plant, or whether it is an exudation from the insects[4]. The insects in question live in the deserts around Israel, it is not known if the manna can be produced in Britain[K].

tcanta Dye Fuel Hedge Hedge Soil stabilization Tannin WoodVery tolerant of maritime exposure, it makes a good shelter hedge in coastal gardens[7, 11, 49, 75]. It dislikes being trimmed[75]. The plant has a rather open habit, however, and so is not tremendously effective at reducing wind speeds[K]. The extensive root system of this plant makes it suitable for use in erosion control in sandy soils[149]. The plant contains a high level of tannin[7]. Galls produced on the plant as a result of insect damage contain up to 40% tannin[240]. The tannin can be used as a dyestuff for fabrics[7]. (No details are given about the colour, though it is likely to be some shade of brown.) Wood - fairly hard, not strong, close grained, takes a high polish, it is often twisted or knotty[61, 149, 227]. Used for general construction, poles, turnery[61, 149]. It makes a good fuel, burning well even when green due to the wax content of the wood[74].

dwatta Astringent Detergent Diuretic Dysentery Expectorant LaxativeThe branchlets and the leaves are astringent and diuretic[7]. An external compress is applied to wounds to stop the bleeding[7]. The manna produced on the plant is detergent, expectorant and laxative[240]. Galls produced on the plant as a result of insect damage are astringent[240]. They are used in the treatment of diarrhoea and dysentery[240].

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy[200]. Cuttings of mature wood of the current seasons growth, 15 - 25cm long, planted outdoors in late autumn in a nursery bed or straight into their permanent position. High percentage[11, 200].

nwatta An easily grown plant, succeeding in most soils and tolerant of saline conditions[11]. Grows well in heavy clay soils as well as in sands and even shingle[182]. Usually found near the coast, it succeeds inland if given a fairly good deep loam and a sunny position[11, 200]. Tolerant of maritime winds and dry soils when grown near the coast[11], plants require a moister soil and shelter from cold drying winds when they are grown inland in non-saline soils because they use the soil salts that are found in saline soils to help them reduce transpiration[200]. This species flowers on the current year's growth[227]. Any pruning is best carried out in spring, hedges are also best trimmed at this time[188]. Plants are tolerant of severe pruning, sprouting freely from old wood[K]. The very closely related T. anglica is often included in this species. A good bee plant[74]. This species is notably resistant to honey fungus[88, 200].

### 5.2.673 Holodiscus dumosus

Rock Spiraea

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 4.5 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Holodiscus dumosus is a deciduous Shrub growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[105, 177]. Small and dry[161]. The leaves can be steeped in water to make a tea[257].

tcanta None known

dwatta Antiseptic Astringent StomachicA decoction of the root has been used in the treatment of diarrhoea and stomach disorders[257]. A decoction of the stems has been used in the treatment of colds and stomach disorders[257]. A decoction of the flowers, leaves and stems has been used as an antiseptic wash[27].

propta The seed requires 4 months stratification at 4°C. It is best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible. When they are large enough to handle, prick the seedlings out

wood, 7 - 10cm with a heel, July/August in a frame[11, 78]. They take about 2 months to root and should be overwintered in a greenhouse, planting out in late spring[78]. Fair to good percentage[78]. Cuttings of almost ripe side shoots, 7 - 12cm with a heel, October/November in a cold frame[78]. Lift the following autumn and plant in their permanent positions[78]. Layering in autumn. Partially sever the layer about 12 months later and lift in the following spring. High percentage[200].

nwatta Requires a well-drained fertile soil in a sheltered position in sun or light shade[1, 200]. Prefers a warm soil that is not too heavy or close[11]. Dislikes calcareous soils[11, 182, 200]. A very ornamental[1] and polymorphic species[58], there are a number of sub-species[200]. *P. villosa sinica*. Rehd. and Wils. is a taller growing form, to 8 metres, and has larger fruits than the type, up to 12mm in diameter[200]. Plants are susceptible to fireblight[200]. The flowers have a hawthorn-like scent[245]. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.669 Lonicera periclymenum

Honeysuckle, European honeysuckle

4 tlin 8 cyuc 1 kcaak 3 tcan 2 dwat 4.5 m hkuc pcmhimmhut cyutli hgattcup hwicli hrasjlutnyik hpa7tli frusflatprikliwisslip hpa7tmwatli fyfxre7t hjonli

drutta Lonicera periclymenum is a deciduous Climber growing to 4.5 m (14ft 9in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Flowers NectarEdible Uses: Children (of all ages) suck the base of the flowers to extract the nectar[66].

tcanta A climbing plant, it can be allowed to scramble on the ground where it makes a good ground cover[208]. Plants should be spaced about 1.2 metres apart each way[208]. A very good moth and butterfly plant[30], it is also an important food for many caterpillars including the larvae of the rare white admiral butterfly[186]. The dense growth of the plant offers good nesting possibilities for birds[186].

dwatta Antispasmodic Astringent Cathartic Depurative Diaphoretic Diuretic Emetic Expectorant Febrifuge Laxative Mouthwash Skin VulneraryThe plant has expectorant and laxative properties[4]. A syrup made from the flowers has been used in the treatment of respiratory diseases whilst a decoction of the leaves is considered beneficial in treating diseases of the liver and spleen[4]. It is used as a mouthwash for ulcers[66] and is considered to be a good ingredient in gargles[4]. The flowers are antispasmodic, astringent, diuretic, expectorant, febrifuge and sudorific[240]. The fruit is emetic and cathartic[4]. The herbage is used as a cutaneous and mucous tonic and as a vulnerary[4]. It is also diaphoretic[4]. The leaves are laxative and slightly astringent[240]. The seed is diuretic[4]. The bark is anticatarrhal, depurative, diuretic and sudorific[240].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Succeeds in most soils from acid to base-rich[186]. Prefers its roots in the shade with its shoots climbing up into the sun[200]. Plants succeed even in quite deep shade[219]. Established plants are fairly drought tolerant[190]. Plants are hardy to about -20°c[184]. A very orna-

mental plant[1], there are a number of named varieties[184]. The flowers are very fragrant, especially in the evening when it attracts pollinating moths[186, 245]. New leaves often start to open in January with well-grown leaves in April[186]. The leaves fall in November[186]. Twining plants, they can bind themselves so tightly round young trees that they can prevent the trunk from being able to expand[186]. A very good moth and butterfly plant[30], it is also an important food for many caterpillars including the larvae of the rare white admiral butterfly[186]. The dense growth of the plant offers good nesting possibilities for birds[186]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 5.2.670 Clematis ianthina

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Clematis ianthina is a deciduous Climber growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°c[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. Very closely related to *C. fusca*, differing mainly in its short-stalked flowers with small bracts and the more violet coloured flowers[273]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants flower on the current season's new shoots. They can usually be left unpruned, though weak or dead shoots can be removed and main shoots can be cut back by up to two thirds of their length if they are outgrowing their allotted area[273]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.671 Miscanthus sinensis

Eulalia, Chinese silvergrass, Silver Feather, Eulalia Grass, Japanese Silver Grass, Ornamental Grass

4 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc

days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

#### 5.2.623 Ribes distans

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Ribes distans is a deciduous Shrub growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Fruit - raw or cooked[177]. An unpleasant taste[74]. The red fruit is up to 8mm in diameter[266].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°c and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°c[200]. This species is closely related to *R. alpinum*[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious, male and female plants must be grown if fruit and seed is required[200].

### 5.2.624 Rubus caesius

Dewberry, European dewberry

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli fyfxre7t hjonli

drutta Rubus caesius is a deciduous Shrub growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[1, 2, 3, 12, 183]. Succulent but not very tasty[74]. A delicious flavour; it is considered to be superior to blackcurrants though the fruit is rather small and consists of just a few drupes[2]. The fruit can be used for making jellies, preserves etc[183]. The fresh or dried leaves are used as a tea substitute[46, 61, 183].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°c and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Succeeds on chalky soils[200]. This species is a blackberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.625 Cardamine schinziana

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Cardamine schinziana is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leafy stems - raw or cooked[105, 177]. A hot peppery flavour.

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°c[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. The following notes are based on the general needs of the genus. Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1].

### 5.2.626 Hosta undulata

4 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmhimmhut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hosta undulata is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root. StemEdible Uses: Young leaves and leaf stems - cooked[105, 177]. Root[105, 177]. No more details are given.

tcanta A good ground cover plant, succeeding in dense shade but rather slow to spread[197]. Plants should be spaced about 25cm apart each way[208]. The sub-species *H. undulata erromena* has been specially mentioned[197] and this can be spaced about 60cm apart each way[208].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A vigorous plant, forming medium sized clumps[200]. A hybrid species of garden origin, the flowers are sterile[200].

## 5.2.627 *Daucus carota*

Wild Carrot, Queen anne's lace, Carrot, Wild Carrot, Queen Anne's Lace

4 tin 8 cyuc 2 kcaak 4 tcan 3 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw  
hpa7tmwatli fyfxre7t hjonli

drutta *Daucus carota* is a BIENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

ckakta Edible Parts: Flowers RootEdible Uses: Coffee CondimentRoot - cooked[55]. Thin and stringy[K]. The flower clusters can be french-fried to produce a carrot-flavoured gourmet's delight[183]. The aromatic seed is used as a flavouring in stews etc[55, 183]. The dried roasted roots are ground into a powder and are used for making coffee[183].

tcanta Cosmetic EssentialAn essential oil obtained from the seed has an orris-like scent[238]. It is used in perfumery and as a food flavouring[46, 238]. The oil has also been used cosmetically in anti-wrinkle creams[238].

dwatta Anthelmintic Carminative Contraceptive Deobstruent Diuretic Emmenagogue Galactogogue Ophthalmic Stimulant UrinaryThe wild carrot is an aromatic herb that acts as a diuretic, soothes the digestive tract and stimulates the uterus[238]. A wonderfully cleansing medicine, it supports the liver, stimulates the flow of urine and the removal of waste by the kidneys[254]. The whole plant is anthelmintic, carminative, deobstruent, diuretic, galactogogue, ophthalmic, stimulant[4, 7, 9, 13, 21, 165]. An infusion is used in the treatment of various complaints including digestive disorders, kidney and bladder diseases and in the treatment of dropsy[4, 238]. An infusion of the leaves

has been used to counter cystitis and kidney stone formation, and to diminish stones that have already formed[254]. Carrot leaves contain significant amounts of porphyrins, which stimulate the pituitary gland and lead to the release of increased levels of sex hormones[254]. The plant is harvested in July and dried for later use. A warm water infusion of the flowers has been used in the treatment of diabetes[213]. The grated raw root, especially of the cultivated forms, is used as a remedy for threadworms[213, 222, 254]. The root is also used to encourage delayed menstruation[213]. The root of the wild plant can induce uterine contractions and so should not be used by pregnant women[213]. A tea made from the roots is diuretic and has been used in the treatment of urinary stones[222]. The seeds are diuretic[213, 218], carminative, emmenagogue and anthelmintic[4, 218]. An infusion is used in the treatment of oedema, flatulent indigestion and menstrual problems[238]. The seed is a traditional 'morning after' contraceptive and there is some evidence to uphold this belief. It requires further investigation[222]. Carrot seeds can be abortifacient and so should not be used by pregnant women[254].

propta Seed - sow August/September or April in situ. The seed germinates better if it is given a period of cold stratification.

nwatta Landscape Uses:Border, Seashore. Prefers a sunny position and a well-drained neutral to alkaline soil[24, 238]. A good plant for the summer meadow[24], it is a food plant for caterpillars of the Swallow-tail Butterfly[200]. This species is the parent of the cultivated carrot[200]. It can act as an alternative host for pests and diseases of the cultivated carrots. The plant has become a pest weed in N. America, where it is spreading rapidly and crowding out native vegetation[274]. The whole plant, when bruised, gives off an aniseed-like scent[245]. Special Features: Edible, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 5.2.628 *Populus trichocarpa*

Western Balsam Poplar, Black cottonwood  
4 tin 8 cyuc 1 kcaak 4 tcan 3 dwat 40 m hkuc  
htut cyutli tcup hwicli hrasljutnyikfrip hpa7tli frusflatprikliw  
hpa7tmwatli nyanhjin hjonli

drutta *Populus trichocarpa* is a deciduous Tree growing to 40 m (131ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: Flowers Inner bark SapEdible Uses: Inner bark - raw or dried. It is usually ground into a powder and used as a flour, this is normally mixed with other flours for making bread etc[172, 177]. It is best used in the spring[172]. The inner bark is mucilaginous[257] and extremely sweet, but it sours or ferments rapidly and so, unlike most inner barks, it cannot be dried for winter use, though it can be sun-dried for more immediate use[256]. Catkins - raw or cooked. A bitter flavour[172]. Sap - used for food[257].

tcanta Adhesive Basketry Containers Cork Dye Fuel Insulation Paint Rooting hormone Scourer Soap Soap making String Stuffing Waterproofing WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. A yellow dye is obtained from the leaf buds[257]. The bark of large trees is thick and corky. It is made into containers for carrying and storing food, also as a lining for underground food stores[99]. The inner bark has been shredded, spun together with red or yellow cedar inner bark (*Thuja plicata*, *Juniperus* spp and *Chamaecyparis nootkatensis*) and used as a twine[257]. A glue is

much disliked by rabbits, so a closely woven fence of this plant can be used as a protective barrier[115]. The bark contains about 10% tannin[223]. Plants can be grown as a hedge[29], the var. 'Gracilis' is suitable for a small hedge on damp sites[182, 200]. It can be kept dense by annual clipping[11]. The plant has an extensive root system and is used in soil reclamation and stabilization projects along estuaries[199]. Dynamic accumulator.

dwatta Anodyne Antiinflammatory Antiperiodic Antiseptic Astringent Diaphoretic Diuretic Dysentery Febrifuge Hypnotic Sedative TonicThe bark is anodyne, anti-inflammatory, antiperiodic, antiseptic, astringent, diaphoretic, diuretic, febrifuge, hypnotic, sedative and tonic[4, 9, 21]. It is a very rich source of salicin, which is used in making aspirin[199]. The bark of this species is used interchangeably with *S. alba*. It is taken internally in the treatment of rheumatism, arthritis, gout, inflammatory stages of auto-immune diseases, diarrhoea, dysentery, feverish illnesses, neuralgia and headache[238]. The bark is removed during the summer and dried for later use[238]. The leaves are used internally in the treatment of minor feverish illnesses and colic[238], cancerous sores and chronic dysentery[218]. The leaves can be harvested throughout the growing season and are used fresh or dried[238]. The twigs are used in the treatment of cancer, dysentery and ulcers[218]. The bark of the stem and roots is anodyne and styptic[218]. It is used in the treatment of rheumatism[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Salix / Willow* for diseases accompanied by fever, rheumatic ailments, headaches (see [302] for critics of commission E).

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Agroforestry Services: Windbreak Fodder: Bank Industrial Crop: Biomass Management: Coppice Other Systems: SRC Regional CropSucceeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Plants prefer an alkaline or neutral soil, rarely doing well in acid conditions[186]. Said to prefer a sandy soil[23, 199], plants are tolerant of dryish soils[11]. Plants are tolerant of salt water[199]. A very ornamental plant[1], it is cultivated for its branches which are used in basket making[11], there are some named varieties[131]. Plants are coppiced annually for this purpose[186] A very important food plant for the caterpillars of many butterfly species[30] and a good bee plant, providing an early source of nectar and pollen[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants should be put into their permanent positions as soon as possible[11]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.667 *Viburnum lantana*

Wayfaring Tree, Wayfaring Tree Viburnum  
4 tin 7 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli kyucupc hwicli hrasljutnyikfrip hpa7tli flatprikliwssip hpa7tmwatli fyfxre7t hjonli

drutta *Viburnum lantana* is a deciduous Shrub growing to 5 m (16ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. It cannot tolerate atmospheric pollution.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A famine food, it is only used when all else fails[177]. The oblong fruit is about 8mm long and contains a single large seed[200].

tcanta Rootstock StringThe young stems can be used as a twine[6]. This species is used as a rootstock for all forms

of viburnums that require grafting[202].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. Unlike most members of the genus, this species succeeds on dry soils[186]. It prefers a deep rich moist loamy soil in sun or semi-shade[11, 200], growing well on chalk and on chalky clays[98]. Intolerant of water-logged soils[186]. Best if given shade from the early morning sun in spring[200]. Dislikes atmospheric pollution[186]. Plants regenerate well after cutting[186]. This plant is a good indicator of limy soils[186]. Tolerates light shade in a woodland[186]. One report says the plant is self-sterile[11], another that it is self-fertile[17]. It would be wise to grow at least two genetically distinct plants of the same species in order to make sure that fruit and seed is produced. Special Features: Not North American native, Naturalizing, Fragrant flowers, Blooms are very showy.

## 5.2.668 *Photinia villosa*

Oriental photinia  
4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Photinia villosa* is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Fruit LeavesEdible Uses: Fruit[177]. No more details are given. The fruit is about 8mm in diameter[200], though occasionally forms with fruits up to 16mm are seen[266]. Leaves - cooked. A famine food, it is only used when all else fails[179].

tcanta WoodThe wood is hard and heavy, suitable for making furniture and other small articles[266].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe in the autumn. Stored seed will probably require stratification and should be sown as early in the year as possible[78]. Germination is usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in a frame[200]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Cuttings of half-ripe

## 5.2.664 *Magnolia stellata*

Star Magnolia

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta *Magnolia stellata* is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked. A famine food, it is only used when all else fails[177]. tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cool after the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200]. Cuttings of half-ripe wood, early summer in a frame[202].

nwatta Landscape Uses:Border, Firewood, Pest tolerant, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Succeeds in acid or neutral soils in sun or part shade[184]. Tolerates alkaline soils so long as they are deep and rich in humus[188]. Prefers plenty of humus in the soil[111]. The branches are brittle so a sheltered position is required[200]. Very tolerant of atmospheric pollution[200]. Dormant plants are hardy to about -15°C[184]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. A very ornamental plant, the flowers start to be produced when the plant is only 2 years old and have a delicate sweet perfume[245], though they are easily damaged by frost or wind[1]. A number of cultivars have been developed for their ornamental value[200]. Plants are slow-growing[202]. Very closely related to *M. kobus* and possibly no more than a geographical form of that species[182]. Special Features: Not North American native, Fragrant flowers, Blooms are very showy .

## 5.2.665 *Chionanthus virginicus*

Fringe Tree, White fringetree, Old Man's Beard, Fringe Tree 4 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikhwisslip hpa7tmwatli nyanhjen hjonli

drutta *Chionanthus virginicus* is a deciduous Shrub growing to 5 m (16ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - used as a pickle like olives[55, 177, 183]. The fruit is up to 18mm long, it has a thin pulp and contains 1 - 3 rounded seeds[227].

tcanta WoodWood - hard, heavy, close grained, weighing about 39lb per cubic foot[82, 227]. Of no commercial value because of the small size of the tree[229].

dwatta Alterative Aperient Cholagogue Diuretic Febrifuge TonicThe fringe tree was commonly used by the North American Indians and European settlers alike to treat inflammations of the eye, mouth ulcers and spongy

gums[254]. In modern herbalism it is considered to be one of the most reliable remedies for disorders of the liver and gall bladder[238]. The dried root bark is alterative, aperient, cholagogue, diuretic, febrifuge and tonic[4, 21, 46, 222, 238]. It is used in the treatment of gallbladder pain, gallstones, jaundice and chronic weakness[254]. A tincture of the bark was once widely used internally in the treatment of hypertrophy of the liver, jaundice, bilious headache, gallstones, rheumatism etc[222, 238]. The root bark also appears to strengthen function in the pancreas and spleen whilst anecdotal evidence indicates that it may substantially reduce sugar levels in the urine[254]. Fringe tree also stimulates the appetite and digestion and is an excellent remedy for chronic illness, especially where the liver has been affected[254]. A tea or a poultice can be made from the root bark for external use as a wash for wounds, inflammations, sores, infections etc[4, 222]. The roots can be harvested at any time of the year, the bark is peeled from them and is then dried for later use[238].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Germination is usually good. Stored seed can be sown in February or March in a warm greenhouse according to one report[78] but germination can them take 18 months at 15 - 20°C[113]. Alternatively the stored seed can be pre-soaked for 2 - 3 hours in warm water and then given 3 months warm stratification followed by 3 months at 2 - 4°C[113]. Germination can then be fairly rapid. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a greenhouse or cold frame. Plant them out into their permanent positions the following spring or early summer. Layering in early summer as soon as new growth is long enough. Takes 15 months[78]. Layering can also be carried out in spring or autumn[200].

nwatta Landscape Uses:Border, Pest tolerant, Specimen, Woodland garden. Prefers a good loamy neutral to acid soil in full sun[1, 11, 182, 200]. Succeeds in partial shade but does not fruit so well in such a position[200]. Plants flower more freely in areas with hotter summers[188] and are slow-growing in areas with cool summers[238]. A very ornamental plant[1, 11], it is hardy to about -25°C[184]. A fast-growing but short-lived tree in the wild, where it is remarkably free from diseases or insect pests[229]. Plants begin to flower and bear fruit when they are 5 - 8 years old[227]. The flowers have a delicate sweet perfume[245]. Dioecious, male and female plants must be grown if seed and fruit is required. This species transplants easily[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Fragrant flowers, Blooms are very showy.

## 5.2.666 *Salix purpurea*

Purple Osier. purpleosier willow

4 tlin 8 cyuc 1 kcaak 4 tcan 3 dwat 5 m hkuc htut cyutli kyuctcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikhwisom hpa7tmwatli nyanhjen hjonli

drutta *Salix purpurea* is a deciduous Tree growing to 5 m (16ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to April, and the seeds ripen in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry moist or wet soil.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172].

tcanta Basketry Fodder Hedge Hedge Repellent Soil reclamation Soil stabilization TanninThe stems are very tough and flexible and are used in basket making[11, 13, 23, 115]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The bark is

made from the aromatic gum on the spring buds[99, 226, 257]. Very strong, it can also be used as a waterproofing for wood etc[99]. When mixed with pigment it can be used as a paint[99]. A string is made from the roots[99]. The supple young branches have been used as lashings or tying thongs[257]. The seed fluff is used as a stuffing material for pillows etc[99]. The wood ashes are a soap substitute[99], they can also be mixed with oil to make a soap[99]. The white inner bark is also a soap substitute, it can be dried and stored for later use[99]. The inner bark has also been used as a scouring pad[257]. The roots have been used for making baskets[257]. Wood - soft, moderately strong, easily worked, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion. Used in making crates, packing material the staves of barrels, woodenware and for pulp[11, 82, 99, 229]. It makes an excellent fuel[99].

dwatta Anodyne Antiinflammatory Antiscorbutic Antiseptic Balsamic Diuretic Expectorant Febrifuge Stimulant TonicWestern balsam poplar has a long history of herbal use. It was commonly used by many native North American Indian tribes who valued it especially for its antiseptic and expectorant properties, using it to treat lung complaints, wounds, skin conditions etc[257]. It is still commonly employed in modern herbalism with much the same uses. The leaf buds are covered with a resinous sap that has a strong turpentine odour and a bitter taste[213]. They also contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213]. The buds are antiscorbutic, antiseptic, balsamic, diuretic, expectorant, stimulant and tonic[4, 226, 238]. They are taken internally in the treatment of bronchitis and upper respiratory tract infections. They should not be prescribed to patients who are sensitive to aspirin[238]. Externally, the buds are used to treat colds, sinusitis, arthritis, rheumatism, muscular pain and dry skin conditions[238]. They can be put in hot water and used as an inhalant to relieve congested nasal passages[213]. The buds are harvested in the spring before they open and are dried for later use[238]. Although no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta Industrial Crop: Biomass Management: Coppice Management: Standard Minor Global Crop Other Systems: Irreg. Intercrop Other Systems: SRC Other Systems: Strip intercropA very easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circumneutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11] but this species is more tolerant of acid soils than other members of the genus[11]. It dislikes shade and is intolerant of root or branch competition[11, 200]. Plants are reasonably wind resistant, but they do not grow well in exposed upland sites[11]. Many forms of this species are susceptible to bacterial canker, the female clone 'Fritzi Pauley' is resistant[11, 200]. A very fast growing[11] and ornamental tree[1], it does well in western Britain where trees have reached 25 metres tall in 20 years[11]. The leaf buds, as they swell in the spring, and the young leaves have a pleasing fragrance of balsam[245]. The fragrance is especially pronounced as the leaves unfold[245]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when

grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.629 *Abies amabilis*

Red Fir,Pacific silver fir

4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 30 m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli hjonli

drutta *Abies amabilis* is an evergreen Tree growing to 30 m (98ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant is not wind tolerant. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: Gum TeaYoung shoot tips are used as a substitute for tea[177, 183]. The pitch obtained from the bark can be hardened (probably by immersing it in cold water[K]) and used as a chewing gum[257]. Inner bark[257]. No further information is given, but inner bark can be dried, ground into a powder and then used with grain flours etc to make bread and other preparations[257].

tcanta Gum WoodThe boughs are fragrant and can be hung in the home as an air freshener[257]. Wood - hard, light, not strong, close grained, not very durable. It is used for framing small buildings but is not strong enough for larger buildings. It is also used for crates, pulp etc[46, 61, 82, 226, 229]. This tree yields the resin 'Canadian Balsam'[226]. The report does not mention the uses of this balsam, but the following are the ways that it is used when obtained from *A. balsamea*:- The balsamic resin 'Balm of Gilead'[11, 46] or 'Canada Balsam' according to other reports[64, 226, 238] is obtained during July and August from blisters in the bark or by cutting pockets in the wood[222]. Another report says that it is a turpentine[171]. It is used medicinally and in dentistry, also in the manufacture of glues, candles and as a cement for microscopes and slides - it has a high refractive index resembling that of glass[11, 46, 64, 82, 222, 226, 238]. The average yield is about 8 - 10 oz per tree[171]. The resin is also a fixative in soaps and perfumery[171, 238].

dwatta This plant was used quite widely by native North American Indians. An infusion of the bark was used as a tonic and to treat stomach ailments, TB, haemorrhoids and various minor complaints[257]. The pitch, or resin, was also used to treat colds, sore throats etc[257]. The bark of this tree contains blisters that are filled with a resin called 'Canadian Balsam'[226]. Although the report does not mention the uses of this resin, it can almost certainly be used in the same ways as the resin of *A. balsamea*, as detailed below:- The resin obtained from this tree (see 'Uses notes' below) has been used throughout the world and is a very effective antiseptic and healing agent. It is used as a healing and analgesic protective covering for burns, bruises, wounds and sores[213, 222, 226]. It is also used to treat sore nipples[213] and is said to be one of the best curatives for a sore throat[245]. The resin is also antiscorbutic, diuretic, stimulant and tonic[4, 171, 222]. It is used internally in propriety mixtures to treat coughs and diarrhoea, though taken in excess it is purgative[238]. A warm liquid of the gummy sap was drunk as a treatment for gonorrhoea[212]. A tea made from the leaves is antiscorbutic[4, 171]. It is used in the treatment of coughs, colds and fevers[222]. The leaves and young shoots are best harvested in the spring and dried for later use[238].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late

spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Requires a good moist but not water-logged soil in a sheltered position[1]. Grows well in heavy clay soils. Plants are very shade tolerant[11, 81] but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. Trees are somewhat shallow rooted and are therefore susceptible to strong winds[229]. Grows best in the Perthshire valleys of Scotland[11]. It does very well on glacial moraines in Scotland[81]. When grown in an open position, the tree clothes itself to the ground with gracefully drooping branches, though on the whole, this species does not grow well in Britain[11]. Trees have been of variable growth in this country and seem to be short-lived[185]. The best and fastest growing specimens are to be found in the north and far west of the country[185]. Growth in girth can be very quick, 1.8 metres in 35 years has been recorded[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. The crushed leaves have an odour like orange peel[11]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species is often confused with *A. nordmanniana*[11]. A very ornamental plant[1]. Trees are sometimes grown as 'Christmas trees'[200]. Plants are susceptible to injury by aphids[11].

### 5.2.630 *Liriodendron tulipifera*

Tulip Tree, Tulip Poplar, Yellow Poplar, Canary Whitewood  
4 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 30 m hkuc  
htut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Liriodendron tulipifera is a deciduous Tree growing to 30 m (98ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe root is used as a lemon-like flavouring in spruce beer, where it also serves to correct the bitterness of the beer[2]. The bark of the root and branches have a pleasant rather pungent scent[11].

tcanta Dye WoodA gold-coloured dye is obtained from the bark[106]. Wood - fine grained, soft, light, easily worked, durable, brittle, not strong but does not split. A valuable timber, it weighs 26lb per cubic foot and is much used for interior finishes, furniture, construction and plywood[11, 46, 61, 171, 229, 235]. Native north americans used the tree for making canoes[270].

dwatta Anthelmintic Aphrodisiac Cardiac Diuretic Dysentery Nerveine Poultice TonicThe intensely acrid bitter inner bark, especially of the roots, is used domestically as a diuretic, tonic and stimulant[82, 213]. The raw green bark is also chewed as an aphrodisiac[222, 257]. The bark contains 'tulipiferine', which is said to exert powerful effects on the heart and nervous system[46, 61, 213]. A tea is used in the treatment of indigestion, dysentery, rheumatism, coughs, fevers etc[222, 257]. Externally, the tea is used as a wash and a poultice on wounds and boils[257]. The root bark and the seeds have both been used to expel worms from the body[213, 257].

propta Seed - best sown as soon as it is ripe in a shady place in a cold frame[80, 113, 200]. Stored seed requires 3 weeks warm then 12 weeks cold stratification[80, 113]. Germination is usually poor, only about 1% of the seed is viable[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into

their permanent positions in late spring or early summer, after the last expected frosts[78]. Layering in spring. Do not sever from the parent plant for 2 years[200].

nwatta Landscape Uses:Pest tolerant, Aggressive surface roots possible, Pollard, Specimen. Requires a deep rich soil[11, 43, 200] and a sheltered but not overshadowed position[1]. Prefers a slightly acid soil[188]. Succeeds in sun or semi-shade[188]. A very ornamental plant[1], it is fast-growing and moderately long-lived in its native range[229]. Flowers are first produced when the tree is about 15 - 20 years old[229]. Liriodendron tulipifera is the state tree of both Indiana and Tennessee[270]. Intolerant of root disturbance, plants are best grown in pots and placed into their final positions as soon as possible. Any transplanting is best done in May[11]. Trees flower best in regions with long hot summers[200]. Plants are particularly susceptible to attacks by rabbits and hares[200]. The flowers produce considerable nectar, making this a good bee plant[21, 229]. Cultivated for its wood in Europe[50]. Special Features:North American native, Attracts butterflies, Fragrant flowers, Attractive flowers or blooms.

### 5.2.631 *Platanus occidentalis*

Buttonwood, American sycamore, American Planetree, Sycamore, American Sycamore

4 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 30 m hkuc  
htut cyutli hgattcuphja7n hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Platanus occidentalis is a deciduous Tree growing to 30 m (98ft) by 30 m (98ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from October to March. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: SapEdible Uses: SweetenerThe sweet sap is tapped in the spring and used in the preparation of syrup and sugar[105, 177, 183].

tcanta Shelterbelt WoodA fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - coarse-grained, tough, strong, very durable, difficult to split[46, 61, 171]. Rather weak according to other reports[227, 229]. It weighs 35lb per cubic foot[235], and is used for furniture, chopping boards etc[46, 61, 171, 229]. Trunks of wild trees can be up to 4.5 metres in diameter and these were at one time hollowed out to make barges capable of carrying several tons of goods[226].

dwatta Antirheumatic Astringent Diuretic Dysentery Emetic Laxative Poultice SalveThe inner bark is astringent, diuretic, emetic and laxative[222]. It has been used as a tea in the treatment of dysentery, coughs, colds, lung ailments, haemorrhages, measles, milky and difficult urination etc and also as a blood tonic[222, 257]. Externally, it has been used as a wash on wounds[257]. An infusion of the bark and roots has been used as a foot soak for treating rheumatism[257]. The bark ooze has been used as a wash on infected sores and an infusion has been given in the treatment of infant rash[257]. An infusion of the bark, mixed with honey locust bark (*Gleditsia triacanthos*), has been used as a gargle to treat hoarseness and sore throat[257].

propta Seed - two months cold stratification improves germination[113]. Sow spring in a cold frame in light shade[78, 98]. Home grown seed is often of poor quality and low viability. It is best to harvest the seed in late winter or spring and then sow it immediately in a cold frame[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of mature wood of the current years growth, 20 - 30 cm with a heel, autumn in a cold frame[1]. Easy[200]. Layering of stools in spring or autumn. Takes 12 months[78].

nwatta Landscape Uses:Aggressive surface roots possible, Pollard, Seashore, Specimen, Street tree. Prefers a deep moist loam[1], though it tolerates very wet, poorly

coppiced annually for this purpose, they do not respond so well to pollarding. It should be cut back almost to ground level each year when being grown for basket making since this encourages the production of long flexible shoots[11]. In very good conditions plants can put on 4 metres or more of new growth in a year when treated in this way. A very important food source for the caterpillars of many butterfly species[30], it is also a valuable early pollen source for bees[11, 186]. The plants are rich in insect life[186]. Best planted into its permanent position as soon as possible[11]. The root system is rather aggressive and can cause problems with drains[200]. Plants are best not grown within 10 metres of buildings. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.661 *Lonicera caprifolium*

Italian Honeysuckle, Italian woodbine

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 6 m hkuc  
pcimhmihhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Lonicera caprifolium* is a deciduous Climber growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaThe fruit is eaten in small quantities[177]. It is probably cooked first[K]. An infusion of the heavily perfumed flowers is used as a tea substitute[7].

tcanta EssentialAn essential oil has been extracted from the flowers and used to make a very sweet perfume, but yields are extremely low[7].

dwatta Antispasmodic Bach Cathartic Diuretic Emetic Emollient Expectorant Laxative Pectoral Skin VulneraryThe fruit is emetic and cathartic[4]. The pressed juice makes a mild purgative[7, 61]. The leaves and flowers are antispasmodic, emollient and expectorant[7]. They are used as a cutaneous and mucous tonic and as a vulnerary[4]. Recent research has shown that the plant has an outstanding curative action in cases of colitis[7]. The seed is diuretic[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Dwelling upon thoughts of the past', 'Nostalgia' and 'Homesickness'[209].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Prefers a good moist soil with its roots in the shade and its top growing into the light[200]. Succeeds even in quite deep shade[219]. Tolerates both acid and alkaline soils, only showing distress on very alkaline soils[202]. Plants are hardy to about -15°C[202]. Plants are moderately fast-growing[202]. They climb by twining around other plants[182]. The flowers are very fragrant, especially of a night time in order to attract pollinating moths, and are produced in abundance[202, 219, 245], but plants only produce fruit after a hot summer[202]. Plants are prone to attacks by mildew and blackfly[202].

### 5.2.662 *Lonicera henryi*

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Lonicera henryi* is an evergreen Climber growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves StemEdible Uses: Edible flowers, leaves and stems[105, 177, 183]. No further details are given, but some caution is advised because this genus contains a number of mildly toxic plants[K].

tcanta MiscellanyA very vigorous climbing plant, it makes a good dense ground cover plant where it has the space to run along the ground, but it will swamp smaller plants[197].

dwatta MiscellanyThe plant is used medicinally in China, but the report gives no more details[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Prefers a good moist soil with its roots in the shade and its top growing up into the light[200]. Plants are hardy to about -20°C[184]. A vigorous climber, supporting itself by twining around other plants[182, 219]. Any pruning is best carried out in the spring[219].

### 5.2.663 *Euonymus hamiltonianus sieboldianus*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 6 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Euonymus hamiltonianus sieboldianus* is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - they must be well boiled[105, 177].This report should be treated with some caution since many members of this genus are poisonous.

tcanta Latex WoodRoots and stem yield gutta-percha, a non elastic rubber used as an electrical insulator and in making plastics etc[61, 103]. Wood - heavy, hard, close-grained. Used for mosaic, printing blocks etc[46].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113]. Stored seed requires 3 months cold stratification so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate[74]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, taken at a node, July/August in a frame. Very easy[200]. Root cuttings in winter[113].

nwatta Thriving in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[11]. This species is often called *E. yedoensis* in the garden[11].



the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of greenwood, 5 - 8cm with a heel, May/June in a frame. Roots in 28 days. A fair percentage[78]. Layering in early spring as the buds break. Takes 12 months. High percentage[78].

nwatta Prefers a sunny sheltered position and a deep moist sandy soil[1, 11]. Succeeds in most moist soils[184] and in most positions[11] so long as they are well-drained[202]. Requires a lime-free soil[200]. Dormant plants are hardy to about -25\*c[184]. A very ornamental plant[1, 11], it has a moderate rate of growth and lives about 100 years[229]. It can flower when only 1.2 metres tall[113]. The flowers have a delicate sweet perfume[245]. The sub-species *H. tetraptera monticola* forms a tree about 24 metres tall. Plants in this genus are notably resistant to honey fungus[200].

### 5.2.658 Celastrus flagellaris

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 7.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Celastrus flagellaris is a deciduous Climber growing to 7.5 m (24ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known

dwatta CancerMany plants in this genus contain compounds of interest for their antitumor activity[218].

propta Seed - gather when ripe, store in dry sand and sow February in a warm greenhouse[78]. Three months cold stratification leads to a higher germination rate[113]. Remove the aril since this inhibits germination[113]. Germination rates are usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in August of the current seasons growth. Takes 12 months[78]. Root cuttings, 6mm thick 25mm long in December. Plant horizontally in pots in a frame[78].

nwatta Prefers a deep loamy soil[11]. A gross feeder, it requires a rich soil[11]. A rampant climber, it requires ample space and is best grown into an old tree[1, 200]. Fruits best when its top growth is in a sunny position[182]. Plants climb by means of twining and by hooked prickles[182]. They do not normally require pruning[219]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious, male and female plants must be grown if seed is required.

### 5.2.659 Rhamnus dahurica

Dahurian Buckthorn

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rhamnus dahurica is a deciduous Shrub growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: Oil TeaLeaves - cooked. They can be parboiled and eaten[183]. The leaves are a tea substitute[177, 183].

tcanta Dye Hedge Hedge Miscellany Oil WoodA green dye is obtained from the leaves and branches[46, 61, 151]. A

yellow dye can be obtained from the bark and the fruit[266]. A lubricating oil is obtained from the seeds[266]. Plants can be grown as an informal hedge, they are also amenable to trimming[200]. The hard wood can be used to make furniture[266].

dwatta MiscellanyThe fleshy fruit is used as medicine[266]. No more details are given.

propta Seed - best sown in the autumn in a cold frame. Stored seed will require 1 - 2 months cold stratification at about 5° and should be sown as early in the year as possible in a cold frame or outdoor seedbed[200]. Germination is usually good, at least 80% by late spring. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta An easily grown plant, it succeeds in any reasonably good soil[11]. This species is very closely related to *R. cathartica*[11]. The species in this genus are notably resistant to honey fungus[200].

### 5.2.660 Salix viminalis

Osier. Basket Willow

4 tlin 8 cyuc 1 kcak 3 tcan 2 dwat 6 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Salix viminalis is a deciduous Tree growing to 6 m (19ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - cooked. Not very palatable[172].

tcanta Basketry Fodder Soil stabilization TanninThe stems are very flexible and are used in basket making[11, 23, 46]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The annual yield can be around 12 tonnes per hectare, 40% of which is class 1[74]. The bark contains about 10% tannin[223]. Often planted along the banks of rivers and lakes to prevent soil erosion[11].

dwatta Anodyne Antirheumatic FebrifugeAntirheumatic, febrifuge[13]. The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Fodder: Bank Industrial Crop: Biomass Industr. Crop: Tannin Management: Coppice Other Systems: SRC Regional CropSucceeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Dislikes heavy shade and dry soils[186]. Rarely thrives on chalk[200]. Tolerates atmospheric pollution[186]. A fast growing tree, it is very wind resistant[K]. Widely cultivated for basket making, there are many named varieties[11, 17]. Trees are usually

drained soils[229]. Requires full sun[200]. Tolerates atmospheric pollution and compacted soils[200]. Established plants are drought tolerant[200]. Fairly wind-resistant[200]. A fast-growing and long-lived tree[200, 229], but it is of no value in Britain, being very susceptible to attack by parasitic fungi[11]. Fairly slow-growing according to another report, which also says that the tree is long-lived in the wild[227]. This species does not do well north of Central France, it requires long hot summers to fully ripen its wood[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

#### 5.2.632 Ulmus villosa

Cherry Bark Elm

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Ulmus villosa is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked.

tcanta WoodWood - hard, somewhat scented. Used for furniture[146].

dwatta None known

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. Susceptible to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200].

#### 5.2.633 Fraxinus americana

White Ash

4 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 25 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwissip hpa7tmwatli nyanhjen hjonli

drutta Fraxinus americana is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from April to May, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or

no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Edible Uses: DrinkA bitter tasting syrup is drawn from the tree[226]. The report gives no more details and does not directly say that the syrup was used as food. It was quite possibly only used medicinally[K].

tcanta Dye Repellent Shelterbelt WoodThe leaves are said to repel rattlesnakes and have been worn on the feet of people travelling in rattlesnake country[213]. There are some doubts over the efficacy of this[213]. A yellow dye is obtained from the bark[226]. Wood - strong, hard, heavy, tough, elastic, close grained, moderately durable[46, 82, 227]. It weighs 41lb per cubic foot, seasons well, takes a good polish and is shock resistant[227]. One of the most valuable of the North American timbers[82, 226], it is much used for tool handles, hockey sticks, baseball bats, the interior of buildings, musical instruments, furniture, woodenware etc[46, 82, 227, 274]. As a fuel it is comparable in quality to such excellent species as oak (*Quercus* spp) and hickory (*Carya* spp)[226].

dwatta Aphrodisiac Astringent Bitter Stings TonicThe bark is astringent, emmenagogue and a bitter tonic[46, 61, 254, 257]. An infusion is used to promote menstruation[257]. It has also been used as a wash to treat skin sores, itches and vermin on the scalp[213, 257]. The inner bark is diaphoretic, diuretic, emetic and strongly laxative[222]. It is used as a tea to remove bile from the intestines, as a tonic after child-birth and to relieve stomach cramps and fevers[222, 257]. It is chewed and applied as a poultice to sores[222]. The leaves are used to soothe the itching caused by mosquito bites and bee stings[229]. The seeds are thought to be aphrodisiac[222].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Landscape Uses:Firewood, Aggressive surface roots possible, Pollard, Street tree. Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[200]. Succeeds in exposed positions[200] and in alkaline soils[11]. Tolerates atmospheric pollution[200]. Young plants tolerate forest shade[226]. One of the most valuable hardwood timber trees in N. America[226], saplings grow slowly at first, but the growth rate speeds up over the next 50 years[229]. This species is planted on a small scale, mainly in E. Europe, as a timber tree[50]. It has the potential as a forestry tree in Britain, succeeding under conditions that are too dry or frosty for the native ash, *F. excelsior*[11]. A very ornamental tree[1], it is often confused in cultivation with *F. pennsylvanica*[50]. Dioecious. Male and female plants must be grown if seed is required. Male trees usually flower heavily each year, but female trees only flower heavily every 2 - 3 years[229]. Special Features: North American native, Attracts butterflies, Inconspicuous flowers or blooms.

### 5.2.634 Populus sieboldii

Japanese Aspen

4 tlin 8 cyuc 1 kcak 2 tcan 1 dwat 20 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Populus sieboldii is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil.

Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and young shoots - cooked[105, 177].

tcanta Rooting hormone WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. Wood - soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11].

dwatta Anodyne Antiinflammatory FebrifugeAlthough no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20-40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It does not do well in exposed upland sites[11]. It dislikes shade and is intolerant of root or branch competition[200]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200].

## 5.2.635 *Tsuga canadensis*

Canadian Hemlock, Eastern hemlock

4 tlin 7 cyuc 1 ckaak 0 tcan 3 dwat 20 m hkuc pcmhmtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat-prikliwis hpa7tmwatli hjonli

drutta *Tsuga canadensis* is an evergreen Tree growing to 20 m (65ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in May, and the seeds ripen from November to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Inner barkEdible Uses: Condiment TeaInner bark - raw or cooked[213]. Usually harvested in the spring[2], it can be dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[2, 46, 161]. An emergency food, it is only used when all else fails[183]. The leaves and twigs yield 'spruce oil', used commercially to flavour chewing gum, soft drinks, ice cream etc[183]. A herbal tea is made from the young shoot tips[2, 62, 95, 159, 183, 257]. These tips are also an ingredient of 'spruce beer'[183].

tcanta Basketry Dye Hedge Hedge Resin Rust Tannin WoodYields a resin similar to Abies balsamea, it is gathered by incisions in the trunk or by boiling the wood[46, 61, 64]. A pitch (called hemlock pitch), is obtained by distillation of

the young branches[46]. 'Oil of Hemlock' is distilled from the young branches according to another report[82]. The bark contains 8 - 14% tannin[46, 171, 223]. The inner bark is used according to one report[82]. The inner bark has been used in making baskets[257]. A red to brown dye is obtained from the bark[21, 46, 257]. A red dye is obtained from the inner bark according to another report[226]. A little rock dust has been added to act as a mordant when boiling the bark[257]. The boiled bark has been used to make a wash to clean rust off iron and steel, and to prevent further rusting[257]. Tolerant of light trimming, plants can be grown as a hedge[81]. This species does not make a good hedge in Britain[200]. Some cultivars can be grown as a ground cover when planted about 1 metre apart each way[208]. 'Pendula' is slow-growing but makes a very good cover[208]. Wood - coarse-grained, light, soft, not strong, brittle, not durable outdoors[21, 46, 61, 82, 171, 229]. Difficult to work because it splits easily[226]. The wood weighs 26lb per cubic foot[235]. The trees do not self-prune and so the wood contains numerous remarkably hard knots that can quickly dull the blade of an axe[226]. A coarse lumber, it is used occasionally for the outside of buildings[21, 46, 61, 82, 171, 229]. It should be used with caution as a fuel for outdoor fires because it can project embers and burning wood several metres from the fire[226].

dwatta Antidiarrhoeal Antipruritic Astringent Diaphoretic Diuretic Dysentery Eczema Skin StypticCanadian hemlock was commonly employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is still sometimes used in modern herbalism where it is valued for its astringent and antiseptic properties. The bark is rich in tannin and is astringent and antiseptic[222, 254]. A decoction is used in the treatment of diarrhoea, colitis, diverticulitis and cystitis[254]. Externally, it is used as a poultice to cleanse and tighten bleeding wounds, as a douche to treat excessive vaginal discharge, thrush and a prolapsed uterus, and as a mouthwash and gargle for gingivitis and sore throats[222, 254]. The poultice has also been applied to the armpits to treat itchininess there[257]. The inner bark is diaphoretic and styptic[21, 213, 257]. An infusion is used in the treatment of colds and abdominal pains[21, 213, 257]. A decoction of the inner bark has been applied externally in the treatment of eczema and other skin conditions[257]. The pulverized inner bark has been applied to cuts and wounds to stop the bleeding[257]. A tea made from the leafy twig tips is used in the treatment of dysentery, kidney ailments, colds and rheumatism[21, 222, 257]. Externally, it is used in steam baths for treating colds, rheumatism and to induce sweating[222]. A decoction of the branches has been boiled down to a syrup or thick paste and used as a poultice on arthritic joints[257]. A poultice of the crushed branch tips has been used to treat infections on an infants navel[257]. Hemlock pitch has been used externally as a counter-irritant in the treatment of rheumatism[213].

propta Seed - it germinates better if given a short cold stratification[80, 113] and so is best sown in a cold frame in autumn to late winter. It can also be sown in early spring, though it might not germinate until after the next winter. If there is sufficient seed, an outdoor sowing can be made in spring[78]. Pot-grown seedlings are best potted up into individual pots once they are large enough to handle - grow them on in a cold frame and plant them out in early summer of the following year. Trees transplant well when they are up to 80cm tall, but they are best put in their final positions when they are about 30-45 cm or less tall, this is usually when they are about 5-8 years old[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

nwatta Landscape Uses:Firewood, Hedge, Aggressive surface roots possible, Massing, Screen, Specimen, Woodland garden. An easily grown plant, it thrives best when growing in a deep well-drained soil in the western parts of Britain where it appreciates the higher rainfall[11]. However, it succeeds in most soils and positions, being especially good on acidic sandy soils[81] but also tolerating some lime[11] so long as there is plenty of humus in the soil[208]. Plants are very shade tolerant when young, but need more sunlight as they grow older[81, 200]. Plants are thin and poor when grown in dry or exposed places[200]. A slow-growing but long-lived species in the wild, with specimens nearly 1000 years old recorded[229]. It is occasionally planted as a

frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates very acid or alkaline soils[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fire-blight[188]. The trees usually have apomictic flowers. They thus produce seed asexually, each seedling being a clone of the parent[11].

## 5.2.655 *Euonymus hamiltonianus*

Hamilton's spindletree

4 tlin 8 cyuc 1 ckaak 0 tcan 0 dwat 9 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta *Euonymus hamiltonianus* is a deciduous Shrub growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - boiled[105, 177].This report should be treated with some caution since many members of this genus are poisonous.

tcanta Latex WoodRoots and stem yield gutta-percha, a non elastic rubber used as an electrical insulator and in making plastics etc[74]. Wood - heavy, hard, close-grained. Used for mosaic, printing blocks etc[46]. Th wood is used to make combs[272].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113]. Stored seed requires 3 months cold stratification so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate[74]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, taken at a node, July/August in a frame. Very easy[200]. Root cuttings in winter[113].

nwatta Thrives in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil. Plants are hardy to about -15°C[184]. A very ornamental plant[1], there are a number of named varieties selected for their good fruiting and autumn colour[184].

## 5.2.656 *Rhus succedanea*

Wax Tree

4 tlin 9 cyuc 1 ckaak 4 tcan 2 dwat 9 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Rhus succedanea* is a deciduous Tree growing to 9 m (29ft) by 9 m (29ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit[105]. The acid pulp is eaten[158, 272]. The edible fruit contains ellagic acid[218]. These reports need to be treated with some caution due to the general toxicity of the species[K].

tcanta Dye Lacquer Mordant Oil Varnish WaxThe leaves contain about 20% tannin[218]. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. The sap is tapped and used as a lacquer[57, 64, 146, 158, 171]. It is much used in Japanese art and needs to be kept in a cool humid place for it to dry properly. The

Japanese traditionally kept their paintings in a damp cave until the lacquer had dried. A yellow dye is obtained from the wood[178]. A wax obtained from the fruit is used to make candles, floor wax, varnish etc[1, 4, 11, 51, 64, 158, 171]. The fruit contains about 17% wax[174]. The fatty acid composition of the wax is 77% palmitic, 5% stearic and arachidic, 6% dibasic, 12% oleic and a trace of linoleic[218]. The seed oil contains 25% glycerides of palmitic, 47% oleic and 28% linoleic[218].

dwatta Antidote Antivinous Cancer Cholagogue Febrifuge OphthalmicAntidote, antivinous, cholagogue, febrifuge, ophthalmic. Used as a wash to counteract varnish poisoning[178]. Use with extreme caution, see notes above on toxicity. The fruit is used in the treatment of phthisis[240]. A wax from the fruits is used in ointments[218]. An ethanolic extract of the leaves exhibits anticancer and antiviral activities[218].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Industrial Crop: Oil Industrial Crop: Wax Management: Standard Regional CropSucceeds in a well-drained fertile soil in full sun[11, 200]. Plants are not very hardy in Britain, though they succeed outdoors in the mildest areas of the country[1, 11]. The young growth in spring can be damaged by late frosts. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. This species is frequently cultivated in Japan for its sap and the wax obtained from its fruit[11]. Many of the species in this genus, including this one, are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.657 *Halesia carolina*

Silver-Bell Tree, Carolina silverbell, Mountain silverbell

4 tlin 8 cyuc 1 ckaak 0 tcan 0 dwat 8 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Halesia carolina* is a deciduous Tree growing to 8 m (26ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: The ripe fruit is chewed for its acidity[183]. Unripe fruits are sometimes pickled[2, 183].The fruit is about 4cm in diameter[200].

tcanta WoodWood - soft, light, close-grained[82]. It weighs 35lb per cubic foot[235]. Trees occasionally grow large enough for saw timber and are then cut and used for panelling and cabinet making[229].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 113, 200]. It takes 18 months to germinate[113]. Warm stratifying the seed for 2 - 3 months at 14 - 25°C then cold stratifying for 2 - 3 months at 0 - 5°C can reduce the germination time. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in

some alkalinity so long as there is at least 50cm of good soil above the alkaline layer[202]. The branches are brittle so a sheltered position is required[200]. Plants are very tolerant of atmospheric pollution[200]. Mature dormant plants are hardy to about -20°c but the flowers are easily damaged by frost or wind.[184]. A warmth-loving species, it is best grown in the south and east of Britain[11]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. A slow growing tree but it flowers whilst young[182]. The flowers have a delicious scent of lemons[182]. A number of cultivars have been developed for their ornamental value. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

### 5.2.653 Salix caprea

Goat Willow, Kilmarnock Willow, Pink Pussy Willow, Pussy Willow

4 tlin 9 cyuc 1 kcaak 4 tcan 2 dwat 10 m hkuc hmimhtut cyutli kyuctcuphja7n hwicli hrasjlutnyikfrjp hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Salix caprea is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to April, and the seeds ripen in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner bark Leaves MannaEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172]. The source of an edible manna[183]. No further details.

tcanta Basketry Charcoal Hedge Hedge Leather Pioneer Shelterbelt Tannin WoodLandscape Uses: Border, Massing, Pollard, Standard, Specimen. The stems are very flexible and are used in basket making[61]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The bark is tough and flexible, it is used as a substitute for leather[115]. The bark contains around 10% tannin[223]. The plant is fast growing and tolerant of maritime exposure, it can be used as a windbreak hedge and shelterbelt though it is of untidy habit[75]. The seeds are very light and so can travel some distance in the wind. The plant is therefore able to find its way to areas such as cleared woodland where the soil has been disturbed. Seedlings will grow away quickly, even in exposed conditions and the plant will provide good shelter for the establishment of woodland plants. Thus it makes a good pioneer species and, except in wetter and moorland-type soils, will eventually be largely out-competed by the other woodland trees. Its main disadvantage as a pioneer plant is that it has an extensive root system and is quite a greedy plant, thus it will not help as much in enriching the soil for the other woodland plants as other pioneer species such as the alders, Alnus species[K].

Some cultivars can be grown as ground cover[208]. 'Pendula' is female whilst 'Kilmarnock' is a male, they should be spaced about 1.5 metres apart each way[208]. Wood - soft, elastic, easily split. Used for baskets, rugs etc[46, 61]. A good quality charcoal is made from the wood[46, 61]. Dynamic accumulator.

dwatta Anodyne Aphrodisiac Astringent Fibrifuge Ophthalmic StimulantThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and fibrifuge[226]. A decoction of the leaves is used in the treatment of fevers[240]. A distilled water from the flowers is aphrodisiac, cordial and stimulant[240]. It is used externally in the treatment of headaches and ophthalmia[240]. The ashes of the wood are useful in the treatment of haemoptysis[240]. The stems and the leaves are astringent[240]. A gum and the juice of the trees are used to increase visual powers[240].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Cuttings of this species do not root well[200]. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Cuttings of this species do not root well[200].

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1], but prefers a damp, heavy soil in a sunny position. Grows in drier soils than any other British species of Salix[186]. Rarely thrives on chalk[200]. Plants are found most frequently on basic soils in the wild[17]. Tolerates atmospheric pollution and exposed positions, including maritime exposure[75, 186]. A fast growing tree, it establishes well[75]. The tree has an untidy habit[75]. A light demanding tree, it becomes tall and drawn when grown in woodland, though it grows well along the sunnier edges[186]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Trees are very tolerant of cutting, they coppice well[186]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Not North American native, Wetlands plant, Attractive flowers or blooms.

### 5.2.654 Sorbus hybrida

Swedish Service Tree, Oakleaf mountain ash
4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikli-wisslip hpa7tmwatli fyfjxre7t hjonli

drutta Sorbus hybrida is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3]. The fruit is up to 10 - 12mm across[200] and is produced in fairly large bunches, making harvesting easier[K].

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold

timber tree in Germany[50]. It is very slow growing in cultivation for the first few years, it then grows more rapidly with annual shoots up to 60cm long. This rate of growth soon slows as the tree loses apical dominance and it becomes slow growing again[185]. Seed production commences around the age of 20 - 40 years, with good crops produced every 3 - 4 years[229]. The crushed foliage has a sweet lemony scent[185]. Another report says that it emits the unpleasant smell of hemlock[245]. Many named forms have been selected for their ornamental value[185]. Almost all of them are dwarf forms[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

#### 5.2.636 Parthenocissus tricuspidata

Boston Ivy, Japanese Ivy, Japanese Creeper
4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 18 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Parthenocissus tricuspidata is a deciduous Climber growing to 18 m (59ft 1in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SapEdible Uses: Sweetener Sap - sweet[177]. The sap flows quite freely when it is harvested in the spring, as the plant comes into new growth, and can be used as a sugar substitute[105].

tcanta This species can be grown as a ground cover plant in a sunny position[188]. Plants should be spaced about 2.5 metres apart each way[208]. They are very vigorous, however, and would soon swamp smaller plants[K].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed requires stratifying for 6 weeks at 5°c and should be sown as early in the year as possible[200]. Germination is variable. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm taken at a node (ensure that it has at least 2 true buds), July/August in a frame[78]. Easy to root but they do not always survive the first winter[182]. Basal hardwood cuttings of current seasons growth, 10 - 12 cm long, autumn in a frame[200]. Layering[200].

nwatta Landscape Uses:Arbor, Woodland garden. Requires a well-drained moisture retentive fertile soil[200]. Succeeds in any fertile soil in sun or part shade[202]. Dormant plants are hardy to about -15°c[200], though the young growth in spring can be damaged by late frosts. A very ornamental plant[1], there are several named varieties[182]. The flowers are only produced on mature stems[202] and plants usually only fruit after a long hot summer[219]. A rampant climbing plant, clinging by means of round pad-like suckers on the tendrils[11]. It can become a bit of a nuisance by growing into gutters[182]. Plants are very tolerant of trimming and can be cut right back to within 1 metre of the base if required to rejuvenate the plant[202]. Any pruning is best carried out in the spring[219]. Dislikes transplanting[11], plants often put on very little growth in the year after planting out, though they are then fast growing[202]. Plants often hybridize and so do not always come true from seed[200]. Special Features: Not North American native, Invasive, Inconspicuous flowers or blooms.

#### 5.2.637 Tsuga caroliniana

Carolina Hemlock

4 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 15 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli hjonli

drutta Tsuga caroliniana is an evergreen Tree growing to 15 m (49ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in April, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: TealInner bark - raw or dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[2, 46, 161]. The leaves and twigs yield 'spruce oil', which is used commercially to flavour chewing gum, soft drinks, ice cream etc[183]. A herbal tea is made from the young shoot tips[2, 62, 95, 159, 183]. These tips are also an ingredient of 'spruce beer'[183].

tcanta Dye Hedge Hedge Resin Rust Tannin WoodThe inner bark has been used to make baskets[257]. A rosy-tan dye can be obtained from the bark[257]. The bark is a source of tannin[257]. All the uses listed below are based on the uses of T. canadensis and reports in [46, 61, 82] that this species has similar uses. Yields a resin similar to Abies balsamea, it is gathered by incisions in the trunk or by boiling the wood[46, 61, 64]. A pitch (called hemlock pitch), is obtained by distillation of the young branches[46]. 'Oil of Hemlock' is distilled from the young branches according to another report[82]. The boiled bark has been used to make a wash to clean rust off iron and steel, and to prevent further rusting[257]. Tolerant of light trimming, plants can be grown as a hedge[81]. This species does not make a good hedge in Britain[200]. Some cultivars can be grown as a ground cover when planted about 1 metre apart each way[208]. 'Pendula' is slow-growing but makes a very good cover[208]. Wood - coarse-grained, light, soft, not strong, brittle, not durable outdoors[21, 46, 61, 82, 171, 229]. Difficult to work because it splits easily[226]. The wood weighs 26lb per cubic foot[235]. The trees do not self-prune and so the wood contains numerous remarkably hard knots that can quickly dull the blade of an axe[226]. A coarse lumber, it is used occasionally for the outside of buildings[21, 46, 61, 82, 171, 229]. It should be used with caution as a fuel for outdoor fires because it can project embers and burning wood several metres from the fire[226].

dwatta Antipiruritic Astringent Birthing aid Diaphoretic Diuretic KidneyThe bark is astringent, diaphoretic and diuretic[21]. A tea made from the inner bark or twigs is helpful in the treatment of kidney or bladder problems, and also makes a good enema for treating diarrhoea[21]. It can also be used as a gargle or mouthwash for mouth and throat problems or externally to wash sores and ulcers[21]. A poultice of the bark has been used to treat itchy armpits[257]. The powdered bark can be put into shoes for tender or sweaty feet or for foot odour[21]. An infusion of the stem tips has been used to treat kidney problems[257]. A decoction of the roots has been used as a birthing aid to help expel the afterbirth[257]. The roots have been chewed in order to treat diarrhoea[257].

propta Seed - it germinates better if given a short cold stratification[80, 113] and so is best sown in a cold frame in autumn to late winter. It can also be sown in early spring, though it might not germinate until after the next winter. If there is sufficient seed, an outdoor sowing can be made in spring[78]. Pot-grown seedlings are best potted up into individual pots once they are large enough to handle - grow them on in a cold frame and plant them out in early summer of the following year. Trees transplant well when they are up to 80cm tall, but they are best put in their final positions when they are about 30 - 45 cm or less tall, this is usually when they are about 5 - 8 years old[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

nwatta Landscape Uses:Hedge, Aggressive surface roots possible, Screen, Specimen. An easily grown plant, it thrives best when growing in a deep well-drained soil in the western parts of Britain where it appreciates the higher rainfall[11]. However, it succeeds in most soils and positions, being especially good on acidic sandy soils[81] but also tolerating some lime[11] so long as there is plenty of humus

in the soil[208]. Plants are very shade tolerant when young, but need more sunlight as they grow older[81, 200]. Plants are thin and poor when grown in dry or exposed places[200]. This species is more tolerant of atmospheric pollution than *T. canadensis*[11]. A slow growing tree in Britain, it requires hot humid summers[200]. It is probably less slow in the far west and in Ireland[185]. Trees have not done well in this country even though they are very cold-tolerant[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

### 5.2.638 Maclura pomifera

Osage Orange, Bois D’Arc
4 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 15 m hkuc
htut cyutli kyucutcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Maclura pomifera is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaakta One report suggests that the fruit is edible[74] but this is surely a mistake - although very large, the fruit is harsh, hard, dry and astringent. The fruit does, however, contain an anti-oxidant which can be used as a food preservative, especially for oils[61]. The heartwood and the root yield a non-toxic antibiotic that is useful as a food preservative[240].

tcanta Dye Fodder Fuel Hedge Yellow Preservative Repellent Shelterbelt Tannin WoodA hedge dye is obtained from the bark of the root and the wood[46, 57, 95, 149, 169, 257]. Green and orange can also be obtained from it[168]. The sap of the fruit is used as an insect repellent[95]. It is said to be effective against cockroaches[222]. The bark is a source of tannin[82, 149]. The plant is often grown as a hedge in N. America and Europe[1, 20, 50], it is very tolerant of severe pruning[200], makes an effective stock-proof barrier[200] and succeeds in maritime exposure[K]. A hedge in a very exposed position at Rosewarne in N. Cornwall has grown well (1989), though it is very bare in winter[K]. This species is also used in shelterbelt plantings[200]. Wood - coarse-grained, exceedingly hard, heavy, flexible, very strong, very durable, silky, lustrous. It weighs 48lb per cubic foot. One of the most durable woods in N. America, it is seldom used commercially, but is used locally for fence posts,piers, bows etc and makes an excellent fuel[46, 82, 95, 171, 200, 227, 229, 274].

dwatta Cardiac OphthalmicA tea made from the roots has been used as a wash for sore eyes[222, 257]. The inedible fruits contain antioxidant and fungicidal compounds[222]. A 10% aqueous infusion and an extract diluted 1:1 have cardiovascular potentialities[240].

propta Seed - best sown as soon as it is ripe in pots in a cold frame. Pre-soak stored seed for 48 hours in warm water and stratify for 2 months at 4°c then sow in a cold frame[113, 200]. Germination is normally good. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed stores for 3 years[113]. If growing larger quantities of plants, it is probably best to sow the seed in an open seed bed[200]. Grow the plants on for a couple of years in the seed bed before planting them out into their permanent positions. Cuttings of half-ripe wood, July/August in a frame[200]. Cuttings of mature wood, November to January in a frame[113]. Layering in summer[200]. Root cuttings 4cm long in December. Plant horizontally in pots in a greenhouse and plant out as soon as possible. Good percentage[78].

nwatta Agroforestry Services: Living fence Fodder: Insect Industrial Crop: Biomass Industrial Crop:

Dye Industrial Crop: Starch Management: Cop-pice Management: Standard Regional Crop Staple Crop: Protein-oilLandscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible. Prefers a well-drained soil in full sun[200]. Succeeds in poor soils and also in dry ones[20]. Plants are fairly tolerant of maritime exposure[K]. They dislike waterlogged soils[188]. Dormant mature plants are hardy to about -20°c though the young growth in spring can be cut back by late frosts[200] and young plants can be damaged in cold winters[188]. Plants require hot summers to fully ripen their wood if they are to thrive in areas with cold winters[188]. Plants are tolerant of severe pruning[200]. This species is notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features:North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms.

### 5.2.639 Sorbus alnifolia

Korean Mountain Ash
4 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 15 m hkuc
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sorbus alnifolia is a deciduous Tree growing to 15 m (49ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[74, 105]. The fruit is about the size of a pea, up to 14mm long[266], and is produced in fairly large bunches making it easy to harvest[200]. The flavour is reasonably mild and somewhat mealy[K].

tcanta WoodWood - even grained. Used for rulers[74].
dwatta None known
propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Landscape Uses:Specimen. Succeeds in most reasonably good soils in an open sunny position[11]. Dislikes dry soils[188]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fire-light[188]. Special Features:Not North American native, Attractive flowers or blooms.

### 5.2.640 Clematis vitalba

Traveller’s Joy, Evergreen clematis
4 tlin 8 cyuc 1 kcaak 1 tcan 2 dwat 15 m hkuc
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Clematis vitalba is a deciduous Climber growing to 15 m (49ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September, and the seeds ripen from October to January. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young shoots - cooked and used like hop shoots (Humulus lupulus)[7, 46, 61]. Caution is advised due to reports of toxicity[7].

kcaakta Edible Parts: Flowers Inner bark Leaves RootEdible Uses: Inner bark - raw or cooked[172, 183]. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172]. Rich in vitamin C[183]. Young catkin-bearing shoots - raw or cooked[183]. The growing tips of underground rhizomes are peeled and eaten[183].

tcanta Basketry Shelterbelt Soil stabilization WoodThe stems are very flexible and are used in basket making[1, 61, 74, 131, 158] or for making wattle and daub walls[158]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. Trees are fast growing and tolerate maritime exposure so can be grown as a shelterbelt[166]. Plants have extensive root systems and are often used to stabilize sand dunes[11, 200]. Wood - soft, even grained, smooth. Used for construction, pales, tubs etc[146, 158]. Dynamic accumulator.

dwatta Anodyne Febrifuge Vitamin CThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year’s growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1], but prefers a deep damp, heavy soil in a sunny position[11, 200]. Rarely thrives on chalk[200]. Succeeds in poor strong soils[131]. Succeeds in maritime exposure[166]. The root system is rather aggressive and can cause problems with drains[200]. It is best not to plant this species within 10 metres of buildings. Hybridizes freely with other members of this genus. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. A very ornamental and fast growing plant[1, 74]. There are some named varieties. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.651 Salix acutifolia

Sharp-Leaf Willow
4 tlin 8 cyuc 1 kcaak 3 tcan 2 dwat 10 m hkuc
htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix acutifolia is a deciduous Shrub growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and added to cereal flours for use in making bread etc. A famine food, it is only used when all else fails[172]. Young shoots - cooked. They are not very palatable[172].

tcanta Basketry Shelterbelt Soil stabilizationStems are very flexible and are used in basket making[46, 61]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. Trees can be planted in shelter-belts for protection against the wind[166]. The extensive root system of this plant is good for binding sandy soils[11]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in

the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year’s growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Very wind-resistant, tolerating maritime exposure[166]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Closely related to *S. daphnoides*[200] and considered to be a part of that species by some authorities[11, 17]. Some named forms have been developed for their ornamental value[182]. There are also named forms cultivated for basket making[46, 61]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.652 Magnolia virginiana

Laurel Magnolia, Sweetbay
4 tlin 8 cyuc 1 kcaak 2 tcan 3 dwat 10 m hkuc
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Magnolia virginiana is a deciduous Tree growing to 10 m (32ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Edible Uses: Condiment TeaThe leaves are used as a condiment in gravies etc[183]. A tea is made from the leaves[183].

tcanta WoodAn essential oil from the flowers has been used in the manufacture of perfumes[227]. Wood - straight-grained, light, soft, easily worked, finishes well, aromatic and yellow in colour[4, 46, 61, 229]. It weighs 31lb per cubic foot[227]. Used for furniture, broom handles, bowls and light woodenware articles etc[46, 61, 227, 229].

dwatta Aromatic Astringent Bitter Diaphoretic Febrifuge Hallucinogenic Malaria StimulantA tea made from the bark is antiperiodic, aromatic, diaphoretic, laxative, stimulant and tonic[4, 222]. It has historically been used as a substitute for quinine in the treatment of malaria[222, 238] and is also taken internally in the treatment of colds, bronchial diseases, upper respiratory tract infections, rheumatism and gout[238, 257]. The bark has been chewed by people trying to break the tobacco habit[222]. The bark is harvested in the autumn and dried for later use[238]. It does not store well so stocks should be renewed annually[238]. A tea made from the fruit is a tonic, used in the treatment of general debility and was formerly esteemed in the treatment of stomach ailments[222]. The leaves or bark have been placed in cupped hands over the nose and inhaled as a mild hallucinogen[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Requires a sunny sheltered position in a deep soil that does not dry out in the summer[11]. Plants are also tolerant of wet soils[238]. Succeeds in acid or neutral soils in sun or part shade[184]. Dislikes limey soils[11]. Tolerates

can be grown outdoors in Britain[11]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.647 Idesia polycarpa

Idesia

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Idesia polycarpa is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is a many seeded berry with a pulpy flesh[2], it is about 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse[78]. Germination is usually very good[78]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first two winters. Plant them out into their permanent positions in late spring, after the last expected frosts and consider giving them some protection from the cold for their first winter or two outdoors[K]. Plants cannot be sexed until they flower[78]. Cuttings of half-ripe wood with a heel, July/August in a frame. Fair percentage[78]. Layering in spring. Takes 12 months[78].

nwatta Prefers a neutral to slightly acid loamy soil, but tolerates a chalky sub-soil if the top soil is deep[200]. Succeeds in full sun or semi-shade[188]. The dormant plant is hardy to about -15°C, though the tree is somewhat hardier if the wood is thoroughly ripened by a long hot summer[200]. The young shoots in spring can be damaged by late frosts. A very ornamental plant[1]. The flowers have a most delicious perfume, which can be wafted far and wide by warm breezes[245]. Trees produce fruit regularly at Kew[11]. Dioecious. Male and female plants must be grown if fruit and seed is required. Female plants can produce some fruit in the absence of a male plant[11].

### 5.2.648 Sorbus pohuashanensis

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyfxre7t hjonli

drutta Sorbus pohuashanensis is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A rather bitter flavour[K]. The fruit is up to 6 - 8mm in diameter[200] and is borne in fairly large bunches which makes harvesting easier[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a

good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Dislikes dry soils[188]. Tolerates light shade[188], though it fruits better in a sunny position[K]. A fast-growing tree, especially in its first few years from seed[K]. Plants are susceptible to firelight[188].

### 5.2.649 Ilex pedunculosa

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Ilex pedunculosa is an evergreen Shrub growing to 10 m (32ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in June, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177, 178]. Some caution is advised, see the notes above on toxicity.

tcanta Dye WoodA dark red dye is obtained from the leaves[178]. Wood - white, beautifully veined[178].

dwatta Carminative Skin TonicCarminative, skin, tonic[178].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged. Plants are hardy to about -10°C[184]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.650 Salix daphnoides

Violet Willow, Daphne willow

4 tlin 8 cyuc 1 kcak 3 tcan 2 dwat 10 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix daphnoides is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from February to March, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

tcanta BasketryThe stems are used in basketry[100, 115].

dwatta Analgesic Bach Diuretic Homeopathy Rubefacient SkinThe leaves are analgesic, diuretic and rubefacient[7, 61]. The boiled roots and stems are used as a cure for the itch[4]. When applied in the nostrils, the plant juice has been used to relieve migraine attacks, but it can also destroy the mucous membranes[7]. The plant should not be taken internally because it is poisonous[7]. A homeopathic remedy is made from the plant. It is used in the treatment of rheumatism and skin eruptions[238]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Indifference', 'Dreaminess', 'Inattention' and 'Unconsciousness'[209]. It is also one of the five ingredients in the 'Rescue remedy'[209].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, taken between nodes, July/August in a frame[1]. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Dislikes acid soils below a pH of 6.0[186]. Succeeds in acid as well as alkaline soils[200]. Plants are hardy to about -18°C[202]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[186, 212]. It is capable of growing 2 metres in a year and can easily smother small trees and shrubs[186]. Another report says that it can grow 5 metres in a year[202]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. The flowers are almond-scented[202]. They are produced on the current season's growth[219]. The plant is very amenable to pruning and can be cut back severely if required. This is best done in early spring[202]. A greedy plant, inhibiting growth of nearby plants, especially legumes[54]. Plants seem to be immune to the predations of rabbits[233]. This species is notably resistant to honey fungus[88, 200].

#### 5.2.641 Salix fragilis

Crack Willow

4 tlin 8 cyuc 1 kcak 3 tcan 3 dwat 15 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix fragilis is a deciduous Tree growing to 15 m (49ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Inner bark LeavesEdible Uses: SweetenerInner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or

cooked. They are not very palatable[172]. A saccharine exudation is obtained from the leaves and young branches[2, 105]. Used as a food[183].

tcanta Basketry Charcoal Tannin WoodStems are very flexible and are used in basket making[46, 61]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The bark contains around 10% tannin[223]. Wood - tough, withstands friction. Used for floors, bases of carts etc[11]. A good quality charcoal is obtained from the wood[61]. Dynamic accumulator.

dwatta Anodyne Astringent Dysentery Febrifuge Poul-tice SypticThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne, astringent and febrifuge[9, 226]. The bark of this species is used interchangeably with *S. alba*. It is taken internally in the treatment of rheumatism, arthritis, gout, inflammatory stages of auto-immune diseases, diarrhoea, dysentery, feverish illnesses, neuralgia and headache[238]. A poultice of the bark has been applied to sores as a styptic and healing agent[257]. The bark is removed during the summer and dried for later use[238]. The leaves are used internally in the treatment of minor feverish illnesses and colic[238]. The leaves can be harvested throughout the growing season and are used fresh or dried[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Salix* / Willow for diseases accompanied by fever, rheumatic ailments, headaches (see [302] for critics of commission E).

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils,[1] but prefers a deep damp, heavy soil in a sunny position[11, 200]. Rarely thrives on chalk[200]. Succeeds in an exposed position[186]. Closely allied to *S. alba*, with which it freely hybridizes[11], though it tolerates poorer soils than that species[186]. A very important food plant for the caterpillars of many butterfly species[30] and a good bee plant, providing an early source of nectar and pollen[11]. The cultivar 'Basfordiana' is used for basket making[131]. Best if planted into its permanent position as soon as possible. The root system is rather aggressive and can cause problems with drains[200]. Plants in this genus are notably susceptible to honey fungus[200]. Plants are very amenable to coppicing or pollarding and can be cut back annually if required[186]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.642 Abies fraseri

She Balsam, Fraser fir, Southern Balsam Fir

4 tlin 7 cyuc 1 kcak 0 tcan 3 dwat 15 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli hjonli

drutta Abies fraseri is an evergreen Tree growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant is not wind tolerant.

kcakta Edible Parts: Inner barkEdible Uses: Condi-ment Gum TeaThe following uses are for the closely related *A. balsamea*. Since this species also has blisters of resin in the bark[81], the uses quite probably also apply here. Inner bark - cooked. It is usually dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 177]. An emergency food, it is only used when all else fails[183]. An aromatic resinous pitch is

found in blisters in the bark[64]. When eaten raw it is delicious and chewy[101, 183]. An oleoresin from the pitch is used as a flavouring in sweets, baked goods, ice cream and drinks[183]. Tips of young shoots are used as a tea substitute[177, 183].

tcanta Adhesive Gum Microscope Repellent Resin Stuffing WoodWood - light, soft, coarse grained, not strong[82]. It is occasionally manufactured into lumber[82]. The following uses are for the closely related *A. balsamea*. Since this species also has blisters of resin in the bark[81], the uses quite probably also apply here. The balsamic resin 'Balm of Gilead'[11, 46] or 'Canada Balsam' according to other reports[64, 226] is obtained during July and August from blisters in the bark or by cutting pockets in the wood[222]. Another report says that it is a turpentine[171]. It is used medicinally, also in the manufacture of glues, candles and as a cement for microscopes and slides - it has a high refractive index resembling that of glass[11, 46, 64, 82, 222, 226]. The average yield is about 8 - 10 oz per tree[171]. The resin is also a fixative in soaps and perfumery[171]. Leaves are a stuffing material for pillows etc - they impart a pleasant scent[46, 61] and also repel moths[169]

dwatta Analgesic Antiscorbutic Antiseptic Diuretic Poulce Stimulant Tonic VDThe following uses are for the closely related *A. balsamea*. Since this species also has blisters of resin in the bark[81], the uses quite probably also apply here. The resin obtained from the balsam fir (see 'Uses notes' below) has been used throughout the world and is a very effective antiseptic and healing agent. It is used as a healing and analgesic protective covering for burns, bruises, wounds and sores[213, 222, 226]. It is also used to treat sore nipples[213] and is said to be one of the best curatives for a sore throat[245]. The buds, resin, and/or sap are used in folk remedies for treating cancers, corns, and warts[269]. The resin is also antiscorbutic, diaphoretic, diuretic, stimulant and tonic[4, 171, 222]. It is used internally in proprietary mixtures to treat coughs and diarrhoea, though taken in excess it is purgative[238]. A warm liquid of the gummy sap was drunk as a treatment for gonorrhoea[212]. A tea made from the leaves is antiscorbutic[4, 171]. It is used in the treatment of coughs, colds and fevers[222]. The leaves and young shoots are best harvested in the spring and dried for later use[238]. This plant was widely used medicinally by various North American Indian tribes[257]. The resin was used as an antiseptic healing agent applied externally to wounds, sores, bites etc., it was used as an inhalant to treat headaches and was also taken internally to treat colds, sore throats and various other complaints[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80]. Trees often self-layer in the wild[226], so this might be a means of increasing named varieties in cultivation[K].

nwatta Landscape Uses:Christmas tree, Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Very shade tolerant, especially when young[81, 126], but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. A shallow-rooted plant, making it vulnerable to high winds[229]. A fast-growing but short-lived species[200]. Trees are very cold hardy but are often excited into premature growth in mild winters and this new growth is susceptible to damage by late frosts[11]. No other member of this genus has proved to be of as little value, or so short-lived as this species; there is scarcely a good tree in the country, though it is attractive when young[11]. Usually short-lived in cultivation, though bearing its interesting cones whilst still young[81]. Young trees can be handsome and vigorous, one grew 120cm in

two years, but growth soon slows[185]. Trees are known to have lived more than 60 years[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Trees have a thin bark and are therefore susceptible to forest fires[229]. This species is closely related to *A. balsamea* and is seen as no more than a form of that species by some botanists[11, 229, 270]. There are some named forms selected for their ornamental value[200]. Trees can produce cones when only 2 metres tall[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones break up on the tree and if seed is required it should be harvested before the cones break up in early autumn[80]. Special Features: North American native, There are no flowers or blooms.

## 5.2.643 Stewartia pseudocamellia

Japanese Stewartia

4 tlin 7 cyuc 1 kcak 2 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Stewartia pseudocamellia is a deciduous Tree growing to 15 m (49ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta Landscape Uses: Espalier, Pest tolerant, Standard, Specimen, Street tree.

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoor seedbed if there is sufficient seed[78]. Stored seed is best soaked for 3 days in warm water and then given 3 - 5 months warm stratification followed by 3 months cold stratification at 5°C, it can take 18 months to germinate[78]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of short side branches, 8cm with a heel, July/August in a frame[1, 200]. One report says it is best to keep the cuttings growing through the winter if possible[1] whilst another says they should be allowed to become dormant once they have rooted[200]. Layering.

nwatta Requires a deep humus-rich moist but not boggy soil[200]. Dislikes limey soils, preferring peaty conditions[11, 200]. Prefers a position with some shade, at least from the midday sun[200]. Another report says that it prefers a sunny sheltered position[11]. Hardy to about -20°C[200]. Resents root disturbance, plants should be put in their permanent positions as soon as possible[11, 200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms.

## 5.2.644 Magnolia kobus

Kobus magnolia, Northern Japanese Magnolia

4 tlin 7 cyuc 1 kcak 0 tcan 1 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Magnolia kobus is a deciduous Tree growing to 12 m (39ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kckahta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaFlowers and flower buds - cooked[177, 183]. The leaves are eaten or used to make a tea[183]. Older leaves are powdered and sprinkled on foods as a flavouring[183].

tcanta WoodWood - soft, light. Used for engraving, utensils, matches etc[46, 61].

dwatta Treats headaches[174].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200]. Cuttings of half-ripe wood in early summer[202].

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Succeeds in acid or neutral soils in sun or part shade[184]. Fairly lime tolerant[200, 202]. The branches are brittle so a sheltered position is required[200]. Very tolerant of atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -28°C[200]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. Plants take 10 - 15 years to flower after being planted out[202]. The leaves are slightly aromatic[188]. Very closely related to *M. stellata*, differing in having 3 narrow sepals and 6 - 9 broader petals. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 5.2.645 Celastrus orbiculatus

Oriental Bittersweet

4 tlin 8 cyuc 1 kcak 1 tcan 2 dwat 12 m hkuc pcmhmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Celastrus orbiculatus is a deciduous Climber growing to 12 m (39ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from November to February. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta Hedge HedgeUsed as a hedge[58]. Ornamental.

dwatta Antiphlogistic Antirheumatic Cancer Depurative TonicThe roots, stems and leaves are antiphlogistic, antirheumatic, depurative and tonic[147, 218]. A decoction of the roots and stems is used internally whilst the crushed fresh leaves are used for external applications[147]. The plant is used in the treatment of paralysis, numbness of the four extremities, headache, toothache, spontaneous abscess formation and snake bites[147]. Many plants in this genus contain compounds of interest for their antitumour activity[218].

propta Seed - gather when ripe, store in dry sand and sow February in a warm greenhouse[78]. Three months cold stratification leads to a higher germination rate[113]. Remove the flesh of the fruit since this inhibits germination[113]. Germination rates are usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[188]. Layering in August of the current seasons growth. Takes 12 months[78]. Root cuttings, 6mm thick 25mm long in December. Plant horizontally in pots in a frame[78].

nwatta Prefers a deep loamy soil[1] but succeeds in most soils so long as they are not too shallow[202]. Succeeds in full or partial shade[188]. Plants flower more freely if their top-growth is in the sun[182]. Requires a humus-rich soil if it is to be at its best[219]. A very ornamental plant[1], it is hardy to about -25°C[200]. A rampant climber, it requires ample space and is best grown into an old tree[1, 200]. It climbs by means of twining and also by the young stems having prickles[182]. Plants do not normally require pruning[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants are usually dioecious, in which case male and female plants must be grown if seed is required, but hermaphrodite forms are in cultivation[11, 182, 200].

## 5.2.646 Eucommia ulmoides

Gutta-Percha

4 tlin 8 cyuc 1 kcak 0 tcan 3 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Eucommia ulmoides is a deciduous Tree growing to 12 m (39ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: LeavesEdible Uses: Young leaves[178]. No further details are given.

tcanta Latex WoodA rubber is obtained from the sap, but not in commercially viable quantities[11, 46, 61]. The leaves contain 3% dry weight of gutta-percha, a non-elastic rubber, used for insulation of electrical wires etc[74]. The gutta-percha is found in all parts of the tree and is extracted by alcohol[61, 174]. The wood is used for making Pattens (a type of shoe with raised soles)[178].

dwatta Analgesic Anticholesterolemic Aphrodisiac Astringent Depurative Diuretic Hepatic Hypotensive Sedative Tonic VasodilatorGutta-percha, known as Du Zhong in China, is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. It is considered to be an excellent tonic for the kidneys and liver, and is thought to act specifically on the lower part of the body[254]. Much interest has been aroused by Du Zhong's ability to reduce high blood pressure. In a clinical trial involving 119 people, 46% of those treated with the herb showed a significant reduction in blood pressure[254]. However, it seems to have little effect in cases of severe hypertension[254]. The stem bark is analgesic, anticholesterolemic, aphrodisiac, depurative, diuretic, hepatic, hypotensive, sedative, tonic and vasodilator[11, 46, 147, 176, 178, 218, 279]. Its use lowers blood pressure (the stir-fried bark is stronger than raw and a decoction is stronger than a tincture) and reduces the absorption of cholesterol[176]. It is used in the treatment of impotence, frequent urination, lumbago, weakness of the lower part of the body, aching back and knees, hypertension and threatened abortion[176, 254]. The flowers and the fruit are astringent[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stratify stored seed for 3 months at 2°C[113]. Germination is usually good and takes place in the first spring[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[11].

nwatta Industrial Crop: Hydrocarbon Management: CoppiceSucceeds in any well-drained moisture retentive soil in full sun with shelter from cold winds[200]. Prefers a good loamy soil[11]. A fast growing[1] and very cold-tolerant tree, withstanding temperatures down to about -20°C[74]. Trees are commonly cultivated in Russia and China, both for gutta percha and for the medicinal used of the stem bark[11, 218]. By using different solvents it is possible to obtain both of these products and the residue is then used for energy production[218]. This species is the only hardy rubber tree that



organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Dye Hedge HedgeA rose-tan dye is obtained from the fruit[168]. Plants are often used in informal hedging[200].

dwatta None known

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°C and then 3 months cold stratification at 4°C[164]. The seed usually germinates within 1 - 18 months at 15°C but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

nwatta An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Tolerates atmospheric pollution[200]. A very hardy species, tolerating temperatures down to at least -15°C[202]. Fairly fast-growing[202]. Hybridizes freely with other members of this genus[200]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Trees are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.894 *Artemisia ludoviciana gnaphalodes*

White Sage

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli hgatyuctcup hwicli hrasjlut hpa7tli priklwis hpa7tmwatli xre7t hjonli

drutta *Artemisia ludoviciana gnaphalodes* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Incense Miscellany MiscellanyBunches of the plants have been used as towels[257]. The plant can be burnt as an incense[257].

dwatta Antirheumatic Fibrifuge Foot care Miscellany Miscellany Ophthalmic Poulitice VulneryAn infusion of the plant is used to treat stomach problems, coughs, colds, headaches etc[61, 257]. A decoction of the leaves is used as a bath to treat fevers and can be applied as a wash to sores, rashes, itches, skin eruptions etc[257]. An infusion of the leaves has been used as an eyewash[257]. The powdered leaves can be applied to the nostrils to stop nose bleeds, sprinkled on sores they will hasten the healing process[257]. The crushed plant can be rubbed on the body as a liniment to treat rheumatic joints, soreness or stiffness[257]. The plant can be placed in the shoes to keep the feet from sweating[257].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, put up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Slugs are attracted to the young shoots in spring and have been known to destroy even well-established plants[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.895 *Chamaecrista fasciculata*

Golden Cassia, Partridge pea

4 tlin 8 cyuc 0 kcaak 1 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Chamaecrista fasciculata* is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Soil stabilizationPlants have an extensive root system and are used to stabilize soils. Grown as an ornamental or for honey production.

dwatta None known

propta Seed - scarify and then pre-soak the seed for 2 - 3 hours in warm water before sowing it from early spring to early summer in a warm greenhouse[138]. The seed usually germinates in 1 - 12 weeks at 23°C[138]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse. Do not plant them out until the following spring[138]. Division as growth commences in spring[11]. Cuttings of moderately ripe wood, July in a frame[1].

nwatta Succeeds in most well-drained soils but prefers an open sandy loam in a sunny sheltered position[1, 200]. Established plants are drought tolerant[200]. Succeeds in light shade, but the plant is much less vigorous when grown in dry shade[200]. Young plants should be mulched each winter until they are well established[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.2.896 *Aster novae*

New England Aster

4 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyfexre7t hjonli

drutta *Aster novae-angliae* is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 2. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

toxicity. Leaves are used as a tea substitute[105, 177]. Some caution is advised, see the notes above on toxicity.

tcanta Dye Hair Ink RepellentA blue dye and an ink are obtained from the fruit[13, 46, 61, 115]. The root juice is used to dye hair black[4]. The leaves are said to repel mice and moles[4, 115]. Plants make a dense ground cover when spaced about 1 metre apart each way[208]. They are best used in large areas, roadsides etc[208]. Our experience to date (1995) is that the plants spread vigorously but do not form a dense cover and so do not exclude other plants[K].

dwatta Antiphlogistic Antirheumatic Appetite Suppressant Cholagogue Diaphoretic Diuretic Expectorant Homeopathy Poulitice PurgativeThe leaves are antiphlogistic, cholagogue, diaphoretic, diuretic, expectorant and laxative[4, 7, 9, 13, 21, 240]. The fruit is also sometimes used, but it is less active than the leaves[4]. The herb is commonly used in the treatment of liver and kidney complaints[4]. When bruised and laid on boils and scalds, they have a healing effect[4]. They can be made into a poultice for treating swellings and contusions[4]. The leaves are harvested in the summer and can be dried for later use[7]. The root is diaphoretic, mildly diuretic and a drastic purgative[4, 7, 9]. Dried, then powdered and made into a tea, it is considered to be one of the best remedies for dropsy[4, 240]. It should only be used with expert supervision because it can cause nausea and vertigo[9]. A homeopathic remedy is made from the fresh berries or the bark[9]. It is used in the treatment of dropsy[9].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Division of suckers in spring or autumn. Very easy.

nwatta Tolerates moist soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. A very invasive plant, sending up new shoots a metre or more away[K]. It can be used for naturalising in the rougher parts of the garden[233], growing well on rough banks etc[1]. The whole plant, when bruised, emits a most unpleasant fur-like smell[245]. The bark, in particular, smells like stale perspiration[245].

## 5.2.730 *Xerophyllum tenax*

Indian Basket Grass, Common beargrass

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Xerophyllum tenax* is an evergreen Perennial growing to 1.2 m (4ft) by 2 m (6ft 7in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - baked[92].

tcanta Basketry Fibre WeavingA watertight basket can be made from the leaves[21, 46, 61, 99, 257]. This basket has been used for cooking food in[257]. The fibres are split from the leaves and then used[92]. The plant is also used to decorate baskets[257]. The small leaves have been used to make dresses[257]. The plants were burnt every year. The leaves were harvested in the spring when they first started to grow out of the charred rhizome. Prior to using, the leaves were soaked in water to make them pliable, but if left too long they turned green[257]. The dried and bleached leaves are used for weaving into hats and capes[207, 257].

dwatta Ophthalmic StypticThe roots are styptic[257]. A poultice of the chewed root has been applied to wounds[257].

A decoction of the grated root has been used as a wash on bleeding wounds, sprains and broken limbs[257]. The washed roots have been rubbed to make a lather and then used to wash sore eyes[257].

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if possible, otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division as the plant comes into growth in the spring.

nwatta Requires a well-drained soil in full sun[187]. Prefers a fairly moisture-retentive sandy peaty soil[1, 200]. Requires a damp peaty soil[233]. Plants can be difficult to cultivate[188]. Plants are hardy to about -20°C[187], especially if the roots are given a good mulch in the winter[200]. If left undisturbed, plants can form quite large colonies, spreading by means of their tough rhizomes[200]. Plants do not flower every year, there are often gaps of 5 - 7 years between flowering[212].

## 5.2.731 *Artemisia absinthium*

Wormwood, Absinthium.

4 tlin 9 cyuc 1 kcaak 2 tcan 3 dwat 1 m hkuc hmimhtut cyutli hgatyuctcup hwicli hyishrasjlut hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Artemisia absinthium* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentLeaves are occasionally used as a flavouring[27, 177, 183]. Caution is advised, prolonged use is known to have a detrimental effect - see the notes above on toxicity[K]. Absinthe - a distilled, highly alcoholic drink usually produced in France, Switzerland, Australia, Spain, and the Czech Republic.

tcanta Repellent StrewingThe fresh or dried shoots are said to repel insects and mice[6, 18, 20, 169], they have been laid amongst clothing to repel moths and have also been used as a strewing herb[4, 14, 257]. An infusion of the plant is said to discourage slugs and insects[14, 18, 201]. The plant contains substances called sesquiterpene lactones, these are strongly insecticidal[254].

dwatta Anthelmintic Antiseptic Antispasmodic Appetizer Carminative Cholagogue Emmenagogue Fibrifuge Homeopathy Hypnotic Stimulant Stomachic Tonic VermifugeWormwood is a very bitter plant with a long history of use as a medicinal herb. It is valued especially for its tonic effect on the liver, gallbladder and digestive system, and for its vermifugal activity[4, 238, 254]. It is an extremely useful medicine for those with weak and underactive digestion. It increases stomach acid and bile production, improving digestion and the absorption of nutrients[254]. It also eases wind and bloating and, if taken regularly, helps the body return to full vitality after a prolonged illness[254]. The leaves and flowering shoots are anthelmintic, anti-inflammatory, antiseptic, antispasmodic, antitumor, carminative, cholagogue, emmenagogue, fibrifuge, hypnotic, stimulant, stomachic, tonic and vermifuge[4, 9, 21, 46, 165, 222, 254]. The plant is harvested as it is coming into flower and then dried for later use[4]. Use with caution[21], the plant should be taken internally in small doses for short-term treatment only, preferably under the supervision of a qualified practitioner[238]. It should not be prescribed for children or pregnant women[238]. See also the notes above on toxicity. The extremely bitter leaves are chewed to stimulate the appetite[222]. The bitter taste on the tongue sets off a reflex action, stimulating stomach and other digestive secretions[254]. The leaves have been used with some success in the treatment of anorexia nervosa[244]. The plant is applied externally to bruises and bites[238]. A warm compress has been used to ease sprains and strained muscles[257]. A

homeopathic remedy is made from the leaves[9]. It is used to stimulate bile and gastric juice production and to treat disorders of the liver and gall bladder[9].

propta Seed - surface sow from late winter to early summer in a greenhouse. The seed usually germinates within 2 - 26 weeks at 15°c[134]. When they are large enough to handle, prick the seedlings out into individual pots. They can be planted out in the summer, or kept in pots in a cold frame for the winter and then planted out in the spring. Cuttings of half-ripe wood, July/August in a frame. Division in spring or autumn.

nwatta Landscape Uses:Border, Ground cover, Seashore. Succeeds in any soil but it is best in a poor dry one with a warm aspect[37]. Established plants are very drought tolerant[190, 200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Prefers a shady situation according to another report[4]. Tolerates a pH in the range 4.8 to 8.2. Wormwood is occasionally grown in the herb garden, there are some named forms[187]. The growing plant is said to inhibit the growth of fennel, sage, caraway, anise and most young plants, especially in wet years[14, 18, 20]. Wormwood is a good companion for carrots, however, helping to protect them from root fly[201]. This herb was at one time the principal flavouring in the liqueur ‘Absinthe’ but its use has now been banned in most countries since prolonged consumption can lead to chronic poisoning, epileptiform convulsions and degeneration of the central nervous system[244]. The scent of the plant attracts dogs[169]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Not North American native, Naturalizing, Suitable for dried flowers.

### 5.2.732 Verbena stricta

Hoary Vervain, Hoary verbena

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli fyifxre7t hjonli

drutta Verbena stricta is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: Teaa tea-like beverage has been made from the leaves[257].

tcanta None known

dwatta Febrifuge StomachicThe plant is thought to be specific for fever and ague[207]. An infusion of the leaves has been used in the treatment of stomach aches[257].

propta Seed - sow early spring in a greenhouse or cold frame[1]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Basal cuttings in early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any moderately fertile well-drained but moisture retentive soil in a sunny position[1, 200]. Plants are hardy to about -20°c[187]. Plants are often short-lived and sometimes only annual[60]. Hybridizes with *V. hastata*[200].

### 5.2.733 Grindelia lanceolata

Rosin Weed, Narrowleaf gumweed, Texan gumweed
4 tin 8 cyuc 1 kcaak 0 tcan 3 dwat 1.5 m hkuc

htut cyutli hgatkyuctcup hwicli hyishrasjltut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Grindelia lanceolata is a BIENNIAL/PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: Gum TeaThe following reports are for the related *G. squarrosa*, they probably also apply to this species[222]. The fresh or dried leaves can be used to make an aromatic, slightly bitter but pleasing tea[183]. A sticky resinous sap that covers the leaves can be used as a chewing gum substitute[183].

tcanta Dye GumThe following report is for the related *G. squarrosa*, it probably also applies to this species[222]. Yellow and green dyes are obtained from the flowering heads and pods[168]. Aromatic.

dwatta Antispasmodic Eczema Expectoant SedativeThe following reports are for the related *G. squarrosa*, they also apply to this species[222]. Rosin weed was used by the native North American Indians to treat bronchial problems and also skin afflictions such as reactions to poison ivy[254]. It is still used in modern herbalism where it is valued especially as a treatment for bronchial asthma and for states where phlegm in the airways impedes respiration[254]. In addition, it is believed to desensitize the nerve endings in the bronchial tree and slow the heart rate, thus leading to easier breathing[254]. The plant merits investigation as a treatment for asthma[222]. The herb is contraindicated for patients with kidney or heart complaints[254]. The dried leaves and flowering tops are antiasthmatic, anti-inflammatory, antispasmodic, expectoant and sedative[4, 46, 207, 212, 238, 254]. The principal use of this herb is in the treatment of bronchial catarrh, especially when there is an asthmatic tendency, it is also used to treat whooping cough and cystitis[4, 254]. The active principle is excreted from the kidneys, and this sometimes produces signs of renal irritation[4, 238]. Externally, the plant is used as a poultice to treat burns, poison ivy rash, dermatitis, eczema and skin eruptions[212, 213, 222, 238]. The plant is harvested when in full bloom and can be used fresh as a poultice or dried for infusions etc[254]. A fluid extract is prepared by placing the freshly gathered leaves and flowers in a small quantity of simmering water for about 15 minutes[213]. A homeopathic remedy is prepared from the leaves and flowering stems[4].

propta Seed - sow autumn or spring in a cool greenhouse and only just cover the seed. Prick out the plants into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer. Division as new growth commences in the spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings.

nwatta Succeeds in any well-drained soil in full sun[200]. Does well on dry sandy banks and in poor soils[200]. Grows mainly in calcareous soils in the wild[274]. Prefers a peaty loam soil[1]. This is one of the first species to invade disturbed or denuded ground and often becomes a serious weed of grazing land[212]. A very polymorphic plant[43].

### 5.2.734 Staphylea bumalda

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Staphylea bumalda is a deciduous Tree growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

### 5.2.890 Spiraea douglasii

Steeplebush, Rose spirea, Menzies’ spirea
4 tin 8 cyuc 0 kcaak 0 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Spiraea douglasii is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta The branches have been used to make brooms[257].

dwatta An infusion of the seeds has been used in the treatment of diarrhoea[257].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Prefers a moist lime-free soil[182], plants quickly become chlorotic on chalk soils[200]. A very cold hardy plant, tolerating temperatures down to about -25°c[200]. Hybridizes freely with other members of this genus[11]. A rampant suckering shrub, it quickly produces dense thickets and can be used for large-scale naturalistic plantings[200]. It is apt to get thin and poor unless divided up fairly regularly and replanted in fairly good soil[1].

### 5.2.891 Macleaya cordata

Plume Poppy

4 tin 10 cyuc 0 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Macleaya cordata is a PERENNIAL growing to 2 m (6ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Insecticide MusicalThe dried hollow stems can be used as whistles[178]. Kills insects and mosquito larvae[147]. The flowers are used to kill maggots whilst the whole plant is used to kill larvae and insects[218].

dwatta Carminative Depurative Diuretic StingsThe whole plant is analgesic, antioedemic, carminative, depurative and diuretic[218]. The juice from the stems of the leaves is used to treat insect bites[4]. A decoction of the leaves and stems is used in the treatment of ringworm[218]. The poisonous sap is used to counter poisonous sores[218].

propta Seed - we have no information on this species but suggest sowing the seed as soon as it is ripe in a cold frame in the autumn. Stored seed should be sown in the early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the dormant season[200]. Basal cuttings in late spring. Harvest the shoots with plenty of

underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Cuttings from the axils of larger leaves in early summer[200]. Root cuttings in the winter[188].

nwatta Landscape Uses:Border, Massing, Specimen. Requires a well-drained deep soil[1] preferring a sunny sheltered position but tolerating light shade[200]. Easily grown in sun or partial shade[187]. Hardy to about -15°c[187]. A very ornamental plant, it can be grown as an isolated specimen in a lawn[1]. An excellent plant for sub-tropical bedding[1]. Plants have spreading underground rhizomes[187] and can be invasive[200]. Special Features:Attractive foliage, Invasive, Naturalizing.

### 5.2.892 Apocynum pictum

Kendyr

4 tin 9 cyuc 0 kcaak 3 tcan 2 dwat 2 m hkuc pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwv hpa7tmwatli hjonli

drutta Apocynum pictum is a PERENNIAL growing to 2 m (6ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Agroforestry Uses: The fragrant flowers are a good source of honey for bees[266 ]. Other Uses: The strong bast fibres obtained from the inner bark are used in making cloth, strings, sails, fishing nests, and high-quality paper[266 ]. The leaves yield up to 5% gum, which is used for making rubber[266 ]. Carbon Farming: Industrial Crop: fiber. The dogbane-milkweed family Asclepias, Apocynum, Calotropis, and Trachomitum spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed fiber or ‘floss’ in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].

dwatta The leaves yield up to 5% gum (?latex), which is used for making a medicine used as a sedative and to treat hypertension[266]. The species has fragrant flowers and is grown as a honey plant[266].

propta Seed - best sown as soon as it is ripe in late summer and overwintered outdoors. The seed requires a period of cold stratification if it is to germinate well[238]. Prick out the seedlings when large enough to handle and grow them on in a cold frame for their first winter, planting out in late spring of the following year[K]. Division in spring just before active growth begins[200]. Plants can also be divided in the autumn[238].

nwatta Industrial Crop: Fiber Management: Hay Regional CropSpecies in this genus generally succeed in sun or shade in most well-drained but moisture-retentive soils[1, 200 ]. The species has fragrant flowers and is grown as a honey plant[266 ]. Apocynum species are used as food plants by the larvae of some Lepidoptera species, including the mouse moth and the Queen butterfly. Climate: cold to warm temperate. Humidity: arid to semi-arid. Carbon Farming - Cultivation: regional crop. Management: hay.

### 5.2.893 Cotoneaster divaricatus

Spreading Cotoneaster

4 tin 8 cyuc 0 kcaak 3 tcan 0 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwv hpa7tmwatli xre7t hjonli

drutta Cotoneaster divaricatus is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female

potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. The young growth in spring can be damaged by late frosts. A fast-growing but short-lived species in the wild[22]. It has brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. The plant has a semi-climbing habit and produces aerial roots[11], and occasionally reaches the size of a small tree[229]. Many of the species in this genus, including this one, are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.888 Veratrum californicum

California False Hellebore

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 2.5 m hkuc  
hminhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Veratrum californicum is a PERENNIAL growing to 2.5 m (8ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta Disinfectant InsecticideThe dried and powdered root is used as an insecticide and a parasiticide[172]. It is also effective against caterpillars and mammals so great caution is advised[1, 19, 20].

dwatta Analgesic Contraceptive Disinfectant Febrifuge Poultrice SalveAlthough a very poisonous plant, California false hellebore was often employed medicinally by a number of native North American Indian tribes who used it mainly as an external application to treat wounds etc[257]. It also had quite a reputation as a contraceptive[257]. It is little, if at all, used in modern herbalism. Any use of this plant, especially internal use, should be carried out with great care and preferably only under the supervision of a qualified practitioner. The root is analgesic, disinfectant and febrifuge[257]. A decoction has been used in the treatment of venereal disease[257]. The roots have been grated then chewed and the juice swallowed as a treatment for colds[257]. A poultice of the mashed raw root has been used as a treatment for rheumatism, boils, sores, cuts, swellings and burns[257]. The dried and ground up root has been used as a dressing on bruises and sores[257]. A poultice of the chewed root has been applied to rattlesnake bites to draw out the poison[257]. The powdered root has been rubbed on the face to allay the pain of toothache[257]. A decoction of the root has been taken orally by both men and women as a contraceptive[61, 257]. A dose of one teaspoon of this decoction three times a day for three weeks is said to ensure permanent sterility in women[207, 254].

propta Unless stored in damp sand at around 4°C the seed has a short viability[200]. Where possible it is best to sow the seed in a lightly shaded position in the greenhouse as soon as it is ripe[200]. Stored seed needs to be stratified but can be very slow to germinate. Germination can be erratic even for seed sown when it was fresh, it usually takes place within 3 - 12 months at 15°C but can be much longer[200]. The plant produces just one seedleaf in its first year, this forms an over-wintering bulb. It takes up to 10 years for the plant to reach maturity[200]. Sow the seed thinly so there is no need to thin or transplant them, and grow the seedlings on undisturbed in the pot for their first two years of growth. Apply a liquid feed at intervals through the growing season to ensure the plants do not become nutrient deficient. At the end of the second year plant out the dormant plants into

individual pots and grow them on in light shade in the greenhouse for a further year or two before planting them out into their permanent positions in late spring or early summer. Division in March/April or in October. Establish the plants in pots in a shaded frame before planting them out[200]. Division is best carried out in the autumn because the plants come into growth very early in the spring[233]. Root cuttings, 6mm long with a bud, rooted in a sandy soil in a cold frame[200].

nwatta Requires a deep fertile moisture retentive humus-rich soil[200]. Succeeds in full sun if the soil does not dry out but prefers a position in semi-shade[200]. Dislikes dry soils[42]. Grows best in a cool woodland garden or a north facing border[42]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants are long-lived and can be left in the same position for years without attention[233].

## 5.2.889 Salix aurita

Eared Sallow

4 tlin 8 cyuc 0 kcaak 3 tcan 2 dwat 2.5 m hkuc  
htut cyutli kyuctcuphja7n hwicli hyishrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix aurita is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry moist or wet soil.

kcaakta None known

tcanta Basketry PioneerPlants have an extensive root system and are used to stabilize waste tips and old slag heaps[199]. The seeds are very light and so can travel some distance in the wind. The plant is therefore able to find its way to areas such as cleared woodland where the soil has been disturbed. Seedlings will grow away quickly, even in exposed conditions and the plant will provide good shelter for the establishment of woodland plants. Thus it makes a good pioneer species and, except in wetter and moorland-type soils, will eventually be largely out-competed by the other woodland trees. Its main disadvantage as a pioneer plant is that it has an extensive root system and is quite a greedy plant, thus it will not help as much in enriching the soil for the other woodland plants as other pioneer species such as the alders, *Alnus* species[K]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Thriving in the most adverse conditions, it is a useful plant for populating dry barren sites[199]. Closely related to *S. caprea* and *S. cinerea*[11]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. When inhaled near to, a scent of white jasmine can be discerned from the flowers[245]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177, 179].

tcanta None known

dwatta None known

propta Seed - this can be very slow to germinate, sometimes taking 18 months or more. It is best sown as soon as it is ripe in a cold frame[200], and some of it at least should then germinate in the spring. Stored seed should be sown as early in the year as possible and given cold stratification - it might not germinate until spring of the following year. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first winter. Plant them out early the following summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Fair to good percentage[78]. Layering in July/August. Takes 15 months. Good percentage[78].

nwatta Tolerant of a wide range of soils so long as they are not too dry[182, 200], it prefers a rich loamy soil in full sun or semi-shade[1, 11, 200]. The Japanese form of this species is rather tender in Britain[11], but in general plants are hardy to about -25°C[184]. The plants flower best in years that follow hot summers[200]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.735 Sanguisorba obtusa

Japanese burnet

4 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
hminhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Sanguisorba obtusa is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105]. A famine food, they are only used when all else fails[105].

tcanta None known

dwatta None known

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the spring.

nwatta Succeeds in ordinary garden soil[1]. Prefers a good moist soil that does not dry out in the summer, in sun or partial shade[187, 200]. Hardy to about -20°C[187]. A very ornamental plant[1].

## 5.2.736 Veronica longifolia

Garden Speedwell, Long-Leaf Speedwell

4 tlin 10 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli fyifxre7t hjonli

drutta Veronica longifolia is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - raw or cooked. A famine food, they are only used when all else fails[179].

tcanta None known

dwatta None known

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in autumn or spring[200]. Larger divisions can be planted out

direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Border, Massing. Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200]. A number of cultivars have been selected for their ornamental value[200]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers, Extended bloom season in Zones 9A and above.

## 5.2.737 Potentilla reptans

Cinquefoil, Creeping cinquefoil

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli fyifxre7t hjonli

drutta Potentilla reptans is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - raw[7]. A useful addition to salads[7].

tcanta CosmeticThe plant is an ingredient in many anti-wrinkle cosmetic preparations for the skin[7].

dwatta Antidiarrhoeal Antispasmodic Astringent Febrifuge OdontalgicBoth the roots and the herb are antispasmodic, astringent and febrifuge[4, 7, 9, 54, 240]. An infusion of the dried herb is used in the treatment of diarrhoea etc, it is also used as a gargle for sore throats and is used externally as an astringent lotion[4]. A concentrated decoction of the root relieves toothache[7].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a dry position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. The plant spreads vigorously by means of runners and can be invasive with new runners up to 1.5 metres long being produced each year[1, 4]. Members of this genus are rarely if ever troubled by browsing deer[233]. The flowers are partially closed in dull weather and close completely of a night time[4]. When closing, self-fertilisation is affected because the anthers are caused to touch the stigmas[4].

## 5.2.738 Lonicera utahensis

Utah Honeysuckle

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Lonicera utahensis is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[212, 257]. The fruit is about 1cm in diameter[60].

tcanta None known

dwatta Laxative SalveThe branches are mildly laxative[257]. An infusion of the branches and leaves has been used as a wash on sores and infections[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200]. Closely related to *L. canadensis*[212].

## 5.2.739 Chasmanthium latifolium

Indian Woodoats, Wild Oats Grass, North American Wild Oats, Northern Sea Oats, Spanglegrass River Oa  
4 tlin 10 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Chasmanthium latifolium is a PERENNIAL growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be used as a cereal in making bread, biscuits etc, or can be ground into a flour and used as a mush[177, 257]. A food crop of the Cocopa Indians of Mexico[236].

tcanta None known  
dwatta None known

propta Seed - sow early spring in situ and only just cover the seed[1]. Division in spring[200].

nwatta Landscape Uses:Container, Erosion control, Massing, Seashore, Specimen. Thrives in full sun or dappled shade on rich, moisture-retentive soils sheltered from strong winds[200]. The dried flower heads are sometimes used in flower arranging[274]. Special Features:Attracts birds, North American native, Invasive,Naturalizing, Wetlands plant, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.2.740 Sanguisorba tenuifolia

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 1.2 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sanguisorba tenuifolia is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known  
dwatta None known

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the spring.

nwatta Succeeds in ordinary garden soil[1]. Prefers a good moist soil that does not dry out in the summer, in sun or partial shade[187, 200]. Hardy to about -25°C[187]. A polymorphic species[58].

## 5.2.741 Artemisia abrotanum

Southernwood  
4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 1.2 m hkuc  
hmimhtut cyutli hgatkuyctcup hwicli hyishrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Artemisia abrotanum is a deciduous Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from March to November, in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: Condiment TeaThe young shoots have a bitter, lemony flavour and are used in small quantities as a flavouring in cakes, salads and vinegars[1, 4, 7, 183, 244]. A tea is made from the young bitter shoots[183].

tcanta Dye Essential Hair Hedge Hedge Incense Potpourri RepellentInsect repellent. The growing plant repels fruit tree moths when growing in an orchard[6, 14, 18, 20]. The fresh plant can also be rubbed onto the skin to deter insects[7]. The shoots can be dried for indoor use, they remain effective for 6 - 12 months[169]. They are also said to repel ants[201]. Shoots can be burnt in the fireplace to remove cooking odours from the house[201]. The leaves have a refreshing lemon-like fragrance and are used in potpourri[245]. An essential oil from the leaves and flowering shoots is used in perfumery in order to add certain subtle tones[7]. A yellow dye is obtained from the branches[14, 268]. Plants can be grown as a low hedge, they tolerate quite hard clipping[200, 201]. An infusion of the plant is used as a hair tonic or conditioner[201].

dwatta Anthelmintic Antiseptic Cholagogue Deobstruent Emmenagogue Stomachic TonicSouthernwood has a long history of domestic herbal use, though it is now used infrequently in herbal medicine[254]. It is a strongly aromatic bitter herb that improves digestion and liver function by increasing secretions in the stomach and intestines, it stimulates the uterus and encourages menstrual flow, lowers fevers, relaxes spasms and destroys intestinal worms[238, 254]. The herb, and especially the young flowering shoots, is anthelmintic, antiseptic, cholagogue, deobstruent, emmenagogue, stomachic and tonic[4, 7, 165]. The main use of this herb is as an emmenagogue, though it is also a good stimulant tonic and has some nervine principle[4]. It is sometimes given to young children in order to expel parasitic worms and externally it is applied to small wounds in order to stop them bleeding and help them to heal[7]. The herb is also used externally in aromatic baths and as a poultice to treat skin conditions[268]. Southernwood should be used internally with caution, see the notes above on toxicity. It should not be prescribed for pregnant women, especially in the first trimester of pregnancy, since it can encourage menstrual flow[238].

propta Seed - surface sow from late winter to early summer in a greenhouse. The seed usually germinates in 1 - 2 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots. Once the seedlings are more than 15cm tall, plant them out into their permanent positions in late spring or summer. Cuttings of young wood 8cm long, May in a frame[169]. Cuttings of half-ripe wood with a heel, July/August in a frame[1].

## 5.2.885 Aster lanceolatus

White Panicle Aster  
4 tlin 8 cyuc 0 kcaak 2 tcan 1 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta Aster lanceolatus is a PERENNIAL growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Attracts wildlife

dwatta Febrifuge VulneraryAn infusion of the plant, combined with another unnamed plant, has been used in the treatment of fevers[257]. A decoction of the plant has been used to dress wounds[257]. The dried and powdered plant has been used as a salve on abrasions[257]. Smoke from the crushed blossoms has been inhaled in the treatment of nosebleeds[257].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200], but it also succeeds in partial shade[233]. Prefers a rich soil[1], but tolerates poor ones[233]. There are some named varieties, selected for their ornamental value[257]. Plants need to be divided every few years, preferably in the spring, in order to keep the plant vigorous[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. The flowers attract butterflies and moths, it is also a good bee plant providing nectar in autumn[30].

## 5.2.886 Osmunda regalis

Royal Fern, Flowering Fern  
4 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta Osmunda regalis is a FERN growing to 2 m (6ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. The seeds ripen from June to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known  
tcanta Compost FibreThe hairs of the plant are mixed

with wool and are used in making cloth[46, 61]. The roots are the source of 'Osmunda fibre', this was once widely used for potting orchids and other epiphytes[200]. Plants can be grown as a ground cover when spaced about 1 metre apart each way[208].

dwatta Astringent Diuretic Tonic VulneraryThe root is astringent, diuretic, tonic and vulnerary[4, 7, 21]. It is useful in the treatment of jaundice and removing obstructions of the visceras[4]. The fronds are used to make compresses for external application to wounds and rheumatic joints - for which purposes they are fairly effective[7]. An infusion of the fronds, combined with wild ginger roots (Asarum species)

has been used in the treatment of children with convulsions caused by intestinal worms[257].

propta Spores - they very quickly lose their viability (within 3 days) and are best sown as soon as they are ripe on the surface of a humus-rich sterilized soil in a lightly shaded place in a greenhouse. Keep the compost moist, preferably by putting a plastic bag over the pot. Plants develop very rapidly, pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Cultivars usually come true to type[200]. Division of the rootstock in the dormant season. This is a very strenuous exercise due to the mass of wiry roots[200].

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden, Specimen, Woodland garden. An easily grown plant[4, 187], it prefers a soil of swamp mud and loamy or fibrous peat, sand and loam[1, 4]. Succeeds in most moist soils, preferring acid conditions[200]. Requires a constant supply of water, doing well by ponds, streams etc[1]. Plants thrive in full sun so long as there is no shortage of moisture in the soil and also in shady situations beneath shrubs etc[200]. Plants are hardy to at least -20°C, they are ever-green in warm winter areas but deciduous elsewhere[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Transplants well, even when quite large[4]. Some named forms have been selected for their ornamental value[187]. Special Features:Attractive foliage, North American native, Naturalizing, Wetlands plant, There are no flowers or blooms.

## 5.2.887 Rhus radicans

Poison Ivy  
4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 2.5 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Rhus radicans is a deciduous Climber growing to 2.5 m (8ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known  
tcanta Dye Ink Mordant OilThe leaves are rich in tannin. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. An excellent marking ink is obtained from this plant[11].

dwatta Hepatic Skin TonicPoison ivy has occasionally been used medicinally, though it is an extremely poisonous plant and great caution should be exercised. Any herbal use should only be undertaken under the supervision of a qualified practitioner. See also the notes above on toxicity. This plant has been used in the past by physicians in the treatment of paralysis and liver disorders[222]. A decoction of the leaves has been used as a tonic and rejuvenator[257]. The whole or the broken leaves have been rubbed over the skin to treat boils and skin eruptions[257]. The leaves have been rubbed on skin that has been affected by a poison ivy reaction[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and

begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.2.883 Solanum dulcamara

Bittersweet. Bittersweet Nightshade, Climbing nightshade, Bittersweet, Deadly Nightshade, Poisonous
4 tin 8 cyuc 0 kcaak 0 tcan 3 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Solanum dulcamara is a PERENNIAL CLIMBER growing to 2.5 m (8ft) by 2.5 m (8ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta None known

tcanta None known

dwatta Alternative Anodyne Cancer Depurative Diuretic Eczema Emetic Expectorant Hepatic Homeopathy Narcotic PurgativeBittersweet is a poisonous plant that has a long history of use in the treatment of skin diseases, warts, tumours, felons etc[238]. It should be used with caution and only under the supervision of a qualified practitioner, this is a poisonous plant that, in excess, paralyzes the central nervous system, slows the heart and respiration, and lowers temperature, causing vertigo, delirium, convulsions and death[21, 238]. See also the notes above on toxicity. All parts of the plant are alterative, anodyne, depurative, mildly diuretic, emetic, expectorant, hepatic, mildly narcotic and purgative[4, 7, 9, 13, 21, 165]. The dried stem, usually collected in the autumn and preferably from the ends of branches 2 - 3 years old, is the part that is most valued medicinally, though the leaves are also used[4]. The plant is chiefly used as an alterative when taken internally in the treatment of a range of skin diseases, it is also used in the treatment of arthritis, rheumatism, bronchial congestion, heart ailments, ulcerative colitis and jaundice[4, 218, 238]. Externally, the plant is used to treat skin eruptions, ulcers, rheumatism and cellulite[238]. Two to three year old stems are harvested in the spring, or after the leaves have fallen in the autumn, and dried for later use[238]. The fruits are marinated in vinegar and applied to cancerous sores and other swellings[218]. A decoction of the root is used in the treatment of cancer and swellings[218]. The root is harvested in the autumn and dried for later use[238]. A homeopathic remedy is made from the fresh, green, still pliant stems and leaves, harvested as the plant begins to flower[232]. This is used in treating a variety of complaints including backaches, cough, diarrhoea, eye inflammations and joint pains[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Solanum dulcamara for eczema, furuncles (boils), acne, warts (see [302] for critics of commission E).

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. If you have sufficient seed then it can be sown outdoors in situ in the spring. Division in spring.

nwatta An easily grown plant, it succeeds in most soils[1, 202]. Prefers a damp shady position and a neutral to alkaline soil[10, 238]. Succeeds in full sun to light shade[202]. If being grown for its medicinal uses, the plant is best placed in a dry and exposed position[4]. Hardy to at least -15°c[202]. Special Features:Attractive foliage, Not North American native, Invasive, Naturalizing, All or parts of this plant are poisonous.

### 5.2.884 Rhus diversiloba

Western Poison Oak, Pacific poison oak
4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 2.5 m hkuc htut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Rhus diversiloba is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known

tcanta Basketry Dye Ink Mordant OilThe leaves are rich in tannin. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The supple stems are used as the warp in basket making[92]. Slender stems are used as circular withes in basket making[257]. An excellent black dye is obtained by exposing the sap to air[92].

dwatta Antidote Contraceptive Eczema Ophthalmic WartsWestern poison oak was employed medicinally by some native North American Indian tribes who used it to treat various complaints[257]. In view of the potential toxicity of the plant, extreme caution is advised in any use of it. See the notes above on toxicity. A leaf has been swallowed in the spring as a contraceptive[257]. A tincture of the fresh leaves has been used in the treatment of eczema and skin diseases[4]. It is also used in the treatment of warts, ringworm etc[92]. A poultice of the fresh leaves has been applied to rattlesnake bites[257]. The leaf buds have been eaten in the spring in order to obtain immunity from the plant poisons[257] A moxa of the plant has been used in the treatment of warts and ringworm[257]. The juice of the plant has been used as a treatment for warts[257]. An infusion of the dried roots has been taken in order to give immunity against any further poisoning[257]. A decoction of the roots has been used as drops in the eyes to heal tiny sores inside the eyelids and to improve vision[257].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[200]. Plants do not require a rich soil[11]. The young growth in spring can be damaged by late frosts. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. This species is closely related to R. toxicodendron[1]. Many of the species in this genus, including this one, are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

nwatta Succeeds in most soils, preferring a well-drained one that is not too rich[1, 11]. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Tolerates a pH in the range 6.3 to 7.6. Established plants are drought tolerant. Plants succeed in maritime gardens[233]. Southernwood is often grown in the herb garden, the leaves are very aromatic[182]. It is best to cut the plant back fairly hard every spring in order to keep it compact and encourage plenty of new growth[233, 268]. The plant rarely produces flowers in British gardens[11]. A good companion plant for cabbages[14, 18, 20]. It is also a good plant to grow in the orchard, where it can help to reduce insect pests[201]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.742 Cimicifuga dahurica

Xing An Sheng Ma

4 tin 8 cyuc 1 kcaak 0 tcan 3 dwat 1.5 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cimicifuga dahurica is a PERENNIAL growing to 1.5 m (5ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Analgesic Antibacterial Antiviral Depurative Diaphoretic Diuretic Febrifuge Sedative TonicThis plant is an anti-infective herb that lowers fevers and reduces pain[238]. The root is analgesic, antibacterial, antiviral, depurative, diaphoretic, diuretic, febrifuge, sedative, tonic[46, 61, 147, 176, 218]. It is used internally in the treatment of coughs, colds, headaches, gum diseases and feverish infections such as measles[238]. The root is harvested in the autumn and used fresh or dried[238]. Use with caution[176], see the notes above on toxicity.

propta Seed - best sown as soon as it is ripe in a cold frame[1]. Only just cover the seed. It germinates in 1 - 12 months or even longer at 15°c[164]. The seed does not store well and soon loses its viability[200], stored seed may germinate better if given 6 - 8 weeks warm stratification at 15°c and then 8 weeks cold stratification[164]. Prick out the young seedlings into individual pots when they are large enough to handle and grow them on in a frame for their first winter. Plant out in late spring or early summer[K]. Division in spring or autumn[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Prefers a moist humus rich soil and some shade[1, 200]. Succeeds in ordinary garden soil[1]. Grows well in a cool moist site in a woodland[200]. The flowers have an unusual, slightly unpleasant smell[188]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.743 Meconopsis grandis

Blue Poppy

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Meconopsis grandis is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil.

Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - roasted and pickled[272].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in late summer. Spring sown seed is slower to germinate[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Some growers prefer to divide the plant immediately after flowering[200].

nwatta Grows best in a woodland soil in partial shade[1, 200]. The soil should be lime-free, moist, well-drained and moderately rich[200]. Dislikes full sun and windy positions[200]. Plants are best divided every three years in order to maintain their vigour[200].

## 5.2.744 Juncus effusus

Soft Rush, Common rush, Lamp rush, Pacific rush

4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcuphja7hns6s hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Juncus effusus is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - raw[118, 257]. Some caution is advised, see the notes above on toxicity.

tcanta Basketry Lighting Paper Strewing String Thatching WeavingStems are used in basket making, thatching, weaving mats etc[23, 46, 66, 99, 115, 171]. The stems can also be dried then twisted or braided into ropes for tying or binding[257]. Stems can be peeled (except for a small spine which is left to keep them upright) and soaked in oil then used as a candle[6, 46, 61, 115]. A fibre obtained from the stems is used for making paper[189]. The stems are harvested in late summer or autumn, they are split and cut into usable pieces and then soaked for 24 hours in clear water. They are then cooked for 2 hours with lye and beaten in a blender. The fibres make an off-white paper[189]. When mixed with mulberry fibres they can be used for making stencil paper[189]. The whole plant was formerly used as a strewing herb[1, 66, 115].

dwatta Antiphlogistic Depurative Diuretic Febrifuge Lenitive Lithontripic Pectoral Sedative UrinaryThe pith of the stem is antiphlogistic, depurative, discutient, diuretic, febrifuge, lenitive, lithontripic, pectoral and sedative[147, 176, 178, 218, 240]. It is used in the treatment of sore throats, jaundice, oedema, acute urinary tract infection and morbid crying of babies[176].

propta Seed - surface sow in pots in a cold frame in early spring and keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown sufficiently, otherwise in late spring of the following year. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in a moist soil, bog garden or shallow water[1, 200]. Prefers a heavy soil in sun or light shade[200].

## 5.2.745 Ammophila arenaria

Marram Grass, European beachgrass

4 tin 8 cyuc 1 kcaak 4 tcan 0 dwat 1.2 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjut hpa7tli frusflatprikliwis hpa7tmwatli xre7t hjonli

drutta Ammophila arenaria is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK

zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: RootEdible Uses: Root[74]. No more details, but the root is rather thin and fibrous[K].

tcanta Basketry Broom Fibre Paper Soil stabilization Thatching WeavingThe flowering stems and leaves are used for thatching, in basketry, making brooms etc[61, 66, 100]. The rhizomes are used for making rope and mats[115]. A fibre obtained from the stems is used for making paper[189]. The stems are harvested in the summer, cut into usable pieces and soaked for 24 hours in clear water before cooking for 2 hours with soda ash. Beat the fibres in a ball mill for 1½ hours. The fibres make a tan-brown paper[189]. This plant has an extensive root system and grows naturally in sand dunes along the coast where it is very important for its action of binding the dunes and therefore allowing other plants to grow. It is much planted in sand dunes and other similar habitats for erosion control[200].

dwatta None known  
propta Seed - sow in pots outdoors as soon as it is ripe or sow in situ during March/April. Division in spring or autumn. nwatta Requires a sunny position in a light well-drained soil. Very tolerant of severe maritime exposure[17]. Tolerates a pH in the range 4.5 to 6.8.

## 5.2.746 *Salvia glutinosa*

Jupiter's Distaff, Sticky Sage

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 1.2 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Salvia glutinosa* is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Condiment GumThe aromatic leaves are used as a flavouring in country wines[183].

tcanta GumAn aromatic gum is obtained from the plant[244]. No details are given of an uses for this gum[K]. Plants can be grown as a ground cover when spaced about 75cm apart each way[208]. They are useful for colonizing large areas[208].

dwatta None known  
propta Seed - sow March/April in a greenhouse[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Succeeds in any good soil in full sun or partial shade[187]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Plants are hardy to about -20°C[187]. During the summer the whole plant becomes covered in a tacky substance like a fragrant gum[245]. This species has a running root system and can spread freely[233]. Plants can be killed by excessive winter wet[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.747 *Ageratina aromatica*

4 tin 8 cyuc 1 kcak 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Ageratina aromatica* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and

female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: One report says that the root is aromatic and suggests that it could be edible[177].

tcanta None known  
dwatta Antispasmodic Diaphoretic Diuretic Expecto- rantThe plant is antispasmodic, diaphoretic, diuretic and expectorant[61]. It is used in the treatment of inflammation and irritability of the bladder[4], ague, pulmonary diseases, stomach complaints and nervous diseases[207].

propta Seed - sow spring in a cold frame, only just covering the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Succeeds in an ordinary well-drained but moisture retentive garden soil in sun or part shade[200].

## 5.2.748 *Festuca pratensis*

Meadow fescue

4 tin 10 cyuc 1 kcak 3 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli frusflatprikliwsslip hpa7tmwatli hjonli

drutta *Festuca pratensis* is an evergreen Perennial growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. It cannot tolerate atmospheric pollution.

kcakta Possible edible seeds [1-4]  
tcanta FodderF. pratensis has been valued for centuries as a pasture grass in temperate regions. It is more cold tolerant than *Festuca arundinacea*, although it is not as productive. Animal feed, fodder, forage. Environmental: Erosion control or dune stabilization. Genetic importance: Gene source. An ornamental grass [1-8]. Faunal Associations: Insects that feed on Fescue grasses (*Festuca* spp.) include caterpillars of the skipper *Atalopedes campestris* (Sachem), larvae of the moth *Pediasia trisecta* (Larger Sod Webworm), *Camnula pellucida* (Clear-winged Grasshopper), *Oulema melanopus* (Cereal Leaf Beetle), *Sphenophorus parvulus* (Bluegrass Billbug), *Blissus leucopterus hirtus* (Hairy Chinch Bug), *Metopolophium dirhodum* (Rose-Grass Aphid), *Rhopalosiphum oxyacanthae* (Apple-Grass Aphid), *Tetraneura ulmi* (Elm and Grass Root Aphid), and other aphids. Horses, cattle, and other hoofed farm animals graze on the foliage of Meadow Fescue. The seeds of Meadow Fescue are eaten by the Greater Prairie Chicken. Meadow Fescue collapses into sprawling mats of vegetation during the winter, which probably provides good cover for voles and other small rodents [1-6].

dwatta None Known  
propta Slow to establish, this grass requires a clean seedbed. Propagated from sown at a rate of 11?28 kg/ha. Optimum temperature for germination, 20?30°C. In mixtures with clovers sown 9?13 kg/ha; with alfalfa, 3 kg/ha. Combines well with clovers, *Lotus corniculatus*, alfalfa and grasses, as *Phleum pratense* and *Dactylis glomerata*, producing a large proportion of leafy bottom growth (Reed, 1976).

nwatta A perennial grass growing 30-120cm high. It can be erect or spreading [1-4]. Ranging from Boreal Moist to Rain through Subtropical Dry Forest Life Zones, meadow fescue is reported to tolerate annual precipitation of 3.2 to 13.6 dm, annual temperature of 4.3 to 21.1°C, and pH of 4.5 to 8.2 (Duke, 1978, 1979). Adapted to cool climates as a cool-season turfgrass. Thrives in deep rich soil, but also grows well on calcareous or sandy soils provided they are moist. In native areas, found in meadows, forest margins, thin forests (Reed, 1976). In Pakistan it grows at about 2,000 m altitude. In Sichuan and Yunnan [1-4]. Flowering from June until August in the Northern Hemisphere. US Forest Service (2016)

them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can also be sown in outdoor seed beds in the autumn. You can leave the plants to grow on in the seedbed for up to 4 years before planting them out into their permanent positions in the winter. Cuttings of half-ripe wood, 5 - 10cm with a heel, July/August in a frame. Very easy[78]. Cuttings of mature wood, 20 - 30cm in a sheltered outdoor bed in November/December[78]. The cuttings can also be placed in situ if required. High percentage[78].

nwatta A very tolerant and easily grown plant, it succeeds in any soil that is not very impoverished[11]. Grows well in heavy clay soils. Prefers a calcareous soil and succeeds in thin dry soils[186]. Grows well in light woodland or the full shade of a wall but flowers and fruits best in a sunny position[186]. Tolerant of atmospheric pollution, once established they also tolerate drought but are intolerant of water-logging[186]. A suckering shrub, forming dense thickets and making good bird cover[186]. An important food plant for many caterpillars, including the larvae of the privet hawk moth[186]. This species is notably susceptible to honey fungus[200]. Special Features:Not North American native, Invasive, Naturalizing, Attractive flowers or blooms.

## 5.2.880 *Baccharis halimifolia*

Bush Groundsel, Eastern baccharis, High Tide Bush, Sea Myrtle, Salt Bush

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 3.5 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwsslipshom hpa7tmwatli nyanhjen hjonli

drutta *Baccharis halimifolia* is a deciduous Shrub growing to 3.5 m (11ft) by 3.5 m (11ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta Fuel Hedge Hedge Soil stabilizationA good fast-growing hedge for exposed maritime conditions[11, K]. It retains its leaves into the new year but is rather bare in late winter[K]. Plants have an extensive root system and can be grown on sand or thin coastal soils in order to bind the soil[200]. Resinous secretions on the leaves and wood make this a useful fuel[11]. It is a fairly small plant though and would not be a very productive source.

dwatta DemulcentThe plant is used as a palliative and demulcent in consumption and cough[207].

propta Seed - no pre-treatment is required[113]. Surface sow in pots a cold frame in the spring, do not let the compost dry out. Germination usually takes place within 1 - 2 weeks[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy[K]. Cuttings of mature wood of the current seasons growth, November in a frame. Easy[K].

nwatta Landscape Uses:Seashore. Succeeds in a sunny position in any well-drained soil[11, 188], from heavy clays to pure sands[113]. Tolerates saline conditions and dry soils[188, 200]. A useful shrub for coastal situations, resisting maritime exposure[11]. Plants are hardy to about -15°C[200]. A fast-growing plant, it is very tolerant of pruning and can be cut right back to the base if required[K]. The presence of this plant growing wild was supposed to indicate areas where oil might be found[207]. Dioecious. Male and female plants must be grown if seed is required. Special Features:North American native, All or parts of this plant are poisonous, Wetlands plant, Attractive flowers or blooms.

## 5.2.881 *Rudbeckia hirta*

Black Eyed Susan, Coneflower, Gloriosa Daisy, Marguerite Jaune

4 tin 9 cyuc 0 kcak 0 tcan 1 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Rudbeckia hirta* is a BIENNIAL/PERENNIAL growing to 2 m (6ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, hoverflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta A yellow dye is obtained from the flowers[257].  
dwatta An infusion of the roots has been used in the treatment of colds, dropsy and worms in children[257]. A warm infusion of the root has been used as a wash on sores and snake bites[257]. The ooze from the roots has been used as drops to treat earaches[257].

propta Seed - sow April in a greenhouse. Only just cover the seed. Germination should take place within 2 weeks, prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer[K]. The seed can also be sown in situ[111].

nwatta Landscape Uses:Border, Container, Foundation, Specimen. Succeeds in an ordinary medium soil in sun or shade[111]. Requires a moist soil[1]. Prefers a well-drained soil[188]. Dormant plants are hardy to about -25°C[187]. This species is a biennial or short-lived perennial[200]. Some named forms have been selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: North American native, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Suitable for cut flowers.

## 5.2.882 *Mildopogon gerardii*

Big Bluestem

4 tin 8 cyuc 0 kcak 2 tcan 1 dwat 2 m hkuc  
htut cyutli kyuctcup hwicli hras hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Mildopogon gerardii* is a PERENNIAL growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta Good forage for horses and cattle, and can also be cut and used for hay. A desirable and ecologically important grass by cattle ranchers and rangeland ecologists. Due to its drought tolerance it is used in wildlife gardens, natural landscaping, and grassland habitat restoration projects. A potential feedstock for ethanol production.

dwatta Analgesic Carminative DiureticThe plant is analgesic, carminative and diuretic[222]. A decoction of the roots is used in the treatment of stomach-aches and flatulence[222, 257]. A tea made from the leaves is used as a wash to relieve fevers and general debility[222, 257].

propta Seed - surface sow in early spring in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on for the first winter in a cold greenhouse. Plant out in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Requires a light porous sandy soil in full sun[200]. A very ornamental plant, it forms large clumps, spreading by short stolons[200]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants



when grown in northern Britain[11]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. The flowers, which start to be produced when the plant is less than a metre tall, are deliciously scented[245]. The young wood is aromatic[219]. Special Features:Attractive foliage, Extended bloom season in Zones 9A and above, Fragrant flowers, Blooms are very showy.

## 5.2.877 Clematis columbiana

Rock Clematis

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Clematis columbiana is a deciduous Climber growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta Hair Insulation TinderThe seed floss makes an excellent tinder for starting fires, a spark from a flint will quickly ignite it[212]. The seed floss can be used as an insulation in shoes etc[212]. An infusion of the leaves alone, or the leaves and stems, has been used as a hair wash to prevent gray hair[257].

dwatta Eczema Foot care Salve SkinA poultice of the pounded, dampened leaves has been applied to the feet to treat sweaty feet[257]. A cold infusion of the plant can be used as a lotion on swollen knees and ankles[257]. The plant has been used as a head wash and to treat scabs and eczema[257].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°c[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.878 Menispermum davuricum

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 3.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Menispermum davuricum is a deciduous Climber growing to 3.6 m (11ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light

(sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antirheumatic Cancer SkinThe root is anti-rheumatic and is also used in the treatment of cancer[218]. The whole plant is used to alleviate skin allergies and is also used in the treatment of cancer[218].

propta Seed - sow late winter in a greenhouse[78, 113]. Two months cold stratification speeds up germination[113] so it might be better to sow the seed as soon as it is ripe in a cold frame[K]. Germination is usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of mature wood, autumn in a frame[200]. Division of suckers in early spring[78, 113]. The suckers can be planted out direct into their permanent positions, though we prefer to pot them up and grow them on in light shade in a greenhouse or cold frame until they are established[K].

nwatta Succeeds in any moderately fertile soil that does not dry out excessively in summer, in sun or partial shade[200]. Prefers full sun[219]. This species is hardy to about -30°c, but, due to a lack of summer heat, the plants usually produce soft growth in mild maritime areas and this can be cut to the ground at temperatures around -5 to -10°c[200]. The plants do not require pruning, but can benefit from being cut back to ground level every 2 - 3 years in order to keep them tidy[219]. Closely related to *M. canadense*, differing mainly in its annual or rarely persistent aerial stems[200]. A twining plant, it spreads freely by means of underground suckers[11, 182]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.879 Ligustrum vulgare

Privet, European privet , Common Privet

4 tlin 7 cyuc 0 kcak 3 tcan 1 dwat 3 m hkuc hmimhtut cyutli hgatkyuctup hwicli hrasjlutnyikfrip hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Ligustrum vulgare is an evergreen Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Basketry Charcoal Dye Ink WoodA yellow dye is obtained from the leaves[6], from the bark, according to other reports[46, 61]. A bluish-green dye is obtained from the berries[6, 46, 61]; it is more permanent than most greens[115]. A black dye can also be obtained from the fruit[61] and an ink[46, 61]. Wood - hard, close-grained. It is valuable for turning if it reaches sufficient size[115] and can also make small tools[46, 61]. The wood is a source of charcoal[46, 61]. The young twigs are used in basketry and hurdle making[46, 61, 100]. Landscape Uses Border, Hedge, Screen, Superior hedge. Naturalizing, Attractive flowers or blooms.

dwatta Astringent Bitter Detergent VulneraryThe leaves are astringent, bitter, detergent, vulnerary[7, 21]. Internal use of this plant should be avoided since it can produce allergic symptoms[7]. Externally it is a safe and effective treatment[7]. The bark has been used as a stomachic[7], though this is not really recommended.

propta Sow the seed in spring in a cold frame. Stored seed germinates better if it is stratified.[113]. Remove any fruit flesh from around the seed before it is sown since this can inhibit germination[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow

records that it is tolerant of acid soils but may also occur in calcareous soils. Although it survives regular mowing, this grass prefers unmowed or little-mowed areas [1-6].

## 5.2.749 Spiraea salicifolia

Bridewort, Willowleaf meadowsweet

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Spiraea salicifolia is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: OilYoung leaves - cooked[177]. Rich in vitamin C[105].

tcanta Hedge Hedge Oil Soil stabilizationA soil stabilizer for river and lakeside banks[200]. Plants are frequently planted in hedges[17].

dwatta Astringent Pectoral Vitamin CThe roots have been used in the treatment of coughs and chest colds[257]. Immature seeds have been used in the treatment of diarrhoea with blood[257].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Prefers a moist lime-free soil[182], plants quickly become chlorotic on chalk soils[200]. A very cold hardy plant, tolerating temperatures down to about -25°c[184]. Hybridizes freely with other members of this genus[11]. A rampant suckering shrub, it quickly produces dense thickets[182]. It is apt to get thin and poor unless divided up fairly regularly and replanted in fairly good soil[1].

## 5.2.750 Sorbus sitchensis

Sitka Mountain Ash, Western mountain ash

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hvihsrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sorbus sitchensis is a deciduous Shrub growing to 1.8 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, preserves etc[62, 105, 161, 183]. Of poor quality[256]. The fruit turns sweeter and so tastes best after a frost[101]. The fruit is produced in clusters, each fruit being about 6 - 12mm in diameter[229].

tcanta Parasiticide Pioneer WoodThis species is capable of growing in exposed conditions in poor soils[229], and so could be used in re-forestation as a pioneer plant to provide suitable conditions for other woodland trees to be established[K]. It is rather slow-growing, however, and would only be used in situations where faster species were not so

suitable[K]. The berries have been rubbed onto the scalp in order to get rid of lice[257]. Wood - moderately light with little strength, it is of no commercial value[229].

dwatta Antirheumatic Enuresis Kidney Parasiticide StomachicAn infusion of the branches has been given to young children with bed-wetting problems[257]. An infusion of the root and branch bark has been drunk in the treatment of stomach problems and rheumatism[257]. The infusion can also be used externally as a bath for treating rheumatism[257]. A decoction of the root and branch bark has been used as an eyewash[257]. The bark has been chewed in the treatment of colds[257]. An infusion of the branches has been used in the treatment of weak kidneys in order to stop the frequent urination[257].

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Dislikes dry soils[188]. Tolerates light shade[188], though it fruits better in a sunny position[K]. This species is able to succeed in poor soils and to become established on exposed broken ground[229], it is thus suitable for use as a pioneer species in re-establishing woodland[K]. A slow-growing shrub in the wild, it can sometimes become a small tree up to 9 metres tall[229]. It usually produces abundant crops of fruit every year[229]. Plants are susceptible to fireblight[188].

## 5.2.751 Matteuccia orientalis

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 0.6 m hkuc hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Matteuccia orientalis is a FERN growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked. A famine food, used when all else fails[177].

tcanta None known

dwatta None known

propta Spores - surface sow as soon as they are ripe in mid-winter and keep the soil moist. It is best to keep the pot in a sealed plastic bag to hold in the moisture. Put up small clumps of the young plants as soon as they are large enough to handle and grow on in light shade until large enough to plant out. Division during the dormant season between October and March[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a moist but well-drained position and light shade[1, 187]. It grows well in heavy clay soils. Prefers a pH between 5 and 6.5[200]. Plants are hardy to about -20°c[200]. Plants have an invasive root system and can send up suckers some distance from the main clump[233]. Members of this genus are rarely if ever troubled by browsing deer[233]. Fertile fronds are produced after the first flush of vegetative fronds and persist throughout the following winter. The spores are shed in mid-winter[200].

## 5.2.752 Orthilia secunda

Sidebells Wintergreen

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 0.1 m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprikliwis hpa7tmwatli fyfkrx7t hjonli

drutta Orthilia secunda is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA

hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: TeaSeed[172]. No more details are given. The leaves are occasionally used as a tea[183].

tcanta None known

dwatta OphthalmicA strong decoction of the root has been used as an eye wash[257].

propta Seed - the only information we have on this species is that it is difficult from seed and germinates infrequently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Pot up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary micorrhiza. Division with great care in the spring[1, 111]. Pot up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. Requires a peaty or leafy but not very acid soil that remains moist in the summer[31, 187]. This is a very difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1].

### 5.2.753 Oenothera odorata

4 tlin 8 cyuc 1 kcaak 2 tcan 0 dwat 0.9 m hkuc htut cyutli kyuctcup hwicli hyhisrasljut hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Oenothera odorata is a PERENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves[105, 177]. No more details are given.

tcanta None known

dwatta None known

propta Seed - sow early spring in a sandy medium in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Basal cuttings in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots of low-fertility soil and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant out in the following spring.

nwatta Prefers a dryish well-drained sandy loam and full sun[1, 200]. Heavy clay soils may induce winter rots[200]. Succeeds in poor soils. The flowers open in the evening, they are richly scented and are very attractive to moths. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 5.2.754 Heuchera glabra

Alpine Heuchera

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc hminhtut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Heuchera glabra is an evergreen Perennial growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[172]. Not choice[172].

tcanta Mordant TanninThe root can be used as an alum substitute, this is a mordant used in fixing dyes[172]. The root is rich in tannin(it contains about 9 - 20%), is this the active ingredient that acts as a mordant?[172]. A good ground cover plant for the woodland garden[200].

dwatta Antiseptic Salve Styptic Tonic VDTThe root is anti-septic, salve, styptic and tonic[172]. It has been used to treat inflammation of the testicles caused by syphilis[257].

propta Seed - sow early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. Division in March or October[1, 111]. It is best to divide the plants in August or early September, making sure that the woody roots are planted quite deeply with only the crown of foliage above the ground[233].

nwatta Succeeds in any good sweet garden soil that does not dry out in spring[1]. Prefers full sun but tolerates partial shade[1, 111]. Prefers a well-drained fairly rich and not too heavy soil[111]. Apt to hybridize with other members of this genus[111]. A very ornamental plant[60].

### 5.2.755 Marsilea quadrifolia

Water Clover, European waterclover

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.2 m hkuc hminhtut cyutli tcuphja7nhs6s hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Marsilea quadrifolia is a FERN growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves SeedEdible Uses: Young stems and leaves[105, 145]. A famine food, only used in times of scarcity[218]. The spores are produced in a sporocarp (like a fairly large container) and in allied species this is ground up and mixed with flour etc and used in making bread etc. It is rich in starch[144].

tcanta None known

dwatta Antidote Antiphlogistic Depurative Diuretic Febrifuge SkinA juice made from the leaves is diuretic and febrifuge[218]. It is also used to treat snakebite and applied to abscesses etc[218]. The plant is anti-inflammatory, diuretic, depurative, febrifuge and refrigerant[147, 178, 218].

propta Spores. The plant produces sporocarps, these need to be lightly abraded and then immersed in water. The sporocarps will then swell and burst to release the spores. The spores germinate immediately, the highly developed prothallus remains inside the large seed-like spores. The gametophyte generation is completed in 24 hours and the first roots and shoots appear in 2 - 3 days. Mature plants bearing sporocarps can develop in as little as 3 months[200]. Spore germination in the family occurs after rupture of the sporocarp wall allows the sporocarp contents to be hydrated. A gelatinous structure emerges from the sporocarp, breaking it into valves and carrying the sori into the water. Spore ger-

one time used by some native North American Indian tribes in order to commit suicide[4]. Because of its toxicity, it is a remedy that is seldom used in modern herbalism[238], but the leaves have been used externally in herbal medicine and are a good remedy for many skin diseases and inflammation[4]. The leaves are analgesic, astringent, disinfectant, narcotic, salve and sedative[257]. An infusion of the leaves is used as a disinfectant wash and liniment to treat pain, scratches, rheumatism, inflammations and to get rid of body parasites[257]. Used internally, the leaves have a splendid effect in the treatment of active haemorrhages, diarrhoea and flux[4, 21, 61]. They are also used in the treatment of syphilis, inflammatory fevers, neuralgia, paralytic conditions, tinnitus and angina[238]. The leaves should be used with great caution however, and only under the guidance of a qualified practitioner[238]. Excess doses cause vertigo, headache, loss of sight, salivation, thirst, nausea, palpitations, slow pulse and difficulty in breathing[238]. See also the notes above on toxicity. Antifungal [303].

propta Seed - surface sow in late winter in a cool greenhouse in light shade[78, 113]. Prick out the young seedlings into individual pots as soon as they are large enough to handle. The seedlings are rather sensitive to damping off, so water them with care, keep them well-ventilated and perhaps apply a fungicide such as garlic as a preventative. Grow the young plants on in light shade and overwinter them in the greenhouse for their first winter[78]. Plant them out into their permanent positions in early summer. The seed is dust-like and remains viable for many years[113]. Cuttings of half-ripe wood, August in a frame. Very poor results unless the cuttings are taken from very young plants[11, 78]. Layering in August/September. Takes 18 months[78]. The plants can also be dug up and replanted about 30cm deeper in the soil to cover up some of the branches. The plant can then be dug up about 12 months later when the branches will have formed roots and can be separated to make new plants[200].

nwatta Landscape Uses:Border, Foundation, Rock garden, Specimen. Requires an acid humus-rich soil, succeeding in part shade[182] or in full sun in cooler areas. Prefers almost full sun[11]. Dislikes dry soils[182], requiring cool, permanently moist conditions at the roots[21]. Succeeds in open woodland or along the woodland edge[200]. Plants are very cold-hardy, tolerating temperatures down to about -30°c[184]. A very ornamental plant[11], there are many named varieties[182]. This species is not very easy to grow well in Britain, it probably prefers a more continental climate[11]. This species is the state flower of Connecticut[238]. Slow to rejuvenate if the plant is cut back[200]. Special Features: Attracts birds, North American native, All or parts of this plant are poisonous, Blooms are very showy.

### 5.2.875 Buddleia davidii

Butterfly Bush, Summer Lilac, Butterflybush

4 tlin 8 cyuc 0 kcaak 1 tcan 0 dwat 3 m hkuc

htut cyutli hgatkyuctcup hwicli hyhisrasljutnyik hpa7tli flatpriklwisslip hpa7tmwatli hjonli

drutta Buddleia davidii is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta DyeBlack or green dyes can be obtained from the flowers, leaves and stems combined[168]. An orange-gold to brown dye can be obtained from the flowers[168]. An extremely popular garden plant due to its low maintenance, long flowering season, colourful and fragrant flowers, and its attractiveness to butterflies. The flowering B. davidii has been closely linked with butterflies, moths and humming-birds [1d].

dwatta None known

propta Seed - cold stratify for 4 weeks at 4°c[138] and surface sow the seed in February/March in a greenhouse[78, 113]. Germination usually takes place within 3 - 4 weeks at 21°c[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Seedlings are inclined to damp off and so should be watered with care and kept well-ventilated[78]. Cuttings of half-ripe wood, July/August in a frame[11, 113]. Use short side-shoots[78]. Very high percentage[113]. Cuttings of mature wood of the current season's growth, 15 - 20cm long, October/November in a frame[200].

nwatta Landscape Uses:Border, Container, Pest tolerant, Massing, Standard, Specimen. Requires a sunny position[11, 182]. Prefers a rich loamy well-drained soil[11, 200]. Very tolerant of alkaline soils, atmospheric pollution and maritime exposure[200]. Grows best on dry soils of low fertility, where it can seed itself freely[182]. Plants are hardy to about -15°c[184], they resprout from the base if cut back by cold weather[200]. A very ornamental plant[1], it hybridizes freely with other members of this genus. Polymorphic, there are many named varieties, developed for their ornamental value[182]. The flowers emit a musk-like fragrance like heather honey[245]. Plants flower mainly on the current years growth so a hard pruning in spring will encourage better flowering[200]. An excellent plant for bees and butterflies[30]. Special Features:Attracts birds, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Attractive flowers or blooms.

### 5.2.876 Magnolia liliiflora

Mu-Lan, Woody Orchid, Lily Magnolia

4 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 3 m hkuc

hminhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Magnolia liliiflora is a deciduous Shrub growing to 3 m (9ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta None known

dwatta Analgesic Anodyne Carminative Febrifuge Sedative TonicThe flowers and unopened flower buds are analgesic, anodyne, carminative, febrifuge, sedative and tonic[147, 218]. The main effect of this herb is to constrict blood vessels in the nasal passages and so it is taken internally in the treatment of sinusitis, allergic rhinitis and colds with a runny nose or catarrh[238]. In excess it can cause dizziness[238]. This herb is incompatible with Astragalus membranaceus[238]. The flowers are harvested in the spring and can be used fresh or dried[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Border, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Prefers a neutral to acid soil but tolerates alkaline soils so long as they are deep and rich in humus[188]. Plants cannot be grown on limy or chalky soils[219]. The branches are brittle so a sheltered position is required[200]. This species is said to be fairly wind tolerant[200]. It is very tolerant of atmospheric pollution[200]. Plants are hardy to about -20°c[200], but they require the protection of a wall

and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

**nwatta** An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Tolerates atmospheric pollution[200]. A very hardy plant, tolerating temperatures down to about -20°C[184]. A fairly fast-growing species[202]. Hybridizes freely with other members of this genus[200]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Trees are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.872 *Cornus rugosa*

Round-Leaved Dogwood

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikwiwis hpa7tmwatli xre7t hjonli

**drutta** *Cornus rugosa* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known

**dwatta** Cathartic Febrifuge Kidney TB TonicThe bark is cathartic, febrifuge and tonic[61, 257]. A decoction of the roots has been used in the treatment of kidney complaints and TB[257].

**propta** Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

**nwatta** An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in poorly drained soils[200]. Succeeds in full sun or light shade[[188]. A very ornamental[1] and free-flowering plant[182]. Plants in this genus are notably resistant to honey fungus[200].

## 5.2.873 *Codonopsis tangshen*

Chuan Dang

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

**drutta** *Codonopsis tangshen* is a PERENNIAL CLIMBER growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both

male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known

**dwatta** Adaptogen Aphrodisiac TonicThis species is an important herb in Chinese medicine, the root is widely used as a substitute for ginseng[4, 174, 238]. It is a sweet, warm, soothing herb that is taken as an energy tonic[238]. It acts mainly on the spleen, lungs and stomach, raising secretion of body fluids and blood sugar levels, lowering the blood pressure and stimulating the immune system[238]. The root and the whole plant are adaptogen, aphrodisiac and tonic[46, 61, 174, 176, 218]. It is taken internally in the treatment of low energy, poor appetite and digestion, anaemia, shallow breathing and debility after illness[238]. It is often cooked with rice until it is glutinous as a tonic food[238]. The roots of plants at least three years old are harvested in the autumn and can be used fresh or dried[238].

**propta** Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to cause the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

**nwatta** Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. It only succeeds in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Dormant plants are hardy to about -20°C[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. An important herb in Chinese medicine, it is widely cultivated there[238] and is used as a ginseng substitute[4, 174]. A climbing plant, supporting itself by twining and scrambling over other plants[219]. Plants resent root disturbance and should be planted out into their permanent position as soon as possible[164]. Plants are very susceptible to the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K].

## 5.2.874 *Kalmia latifolia*

Mountain Laurel, Calico Bush, Ivy

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

**drutta** *Kalmia latifolia* is an evergreen Shrub growing to 3 m (9ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Dye Hedge Hedge WoodA yellow-tan dye is obtained from the leaves[106]. The plant can be grown as an informal hedge[200]. Wood - heavy, hard, strong but rather brittle. It weighs 44lb per cubic foot and is used for making small implements, tool handles etc[21, 46, 61, 82, 235]. The roots are used to make spoons etc, these are fashioned when the wood is green and soft, when dry they become very hard and smooth[207]. The wood is a good fuel[46, 61].

**dwatta** Analgesic Antifungal Antipsoriatic Antiviral Astringent Narcotic Salve Sedative SkinMountain laurel is a very poisonous narcotic plant the leaves of which were at

mination (gametophyte growth) and fertilization occur immediately[270]. Division.

**nwatta** Requires a permanently moist or wet soil, it can be grown by the side of ponds etc or in the shallow edges of the pond[56]. Thrives in a turfy loam or in peat[1]. Hardy to about -15°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.756 *Crocus cancellatus*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikwiwis hpa7tmwatli xre7t hjonli

**drutta** *Crocus cancellatus* is a CORM growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from March to July, in flower from September to November, and the seeds ripen from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Corm - cooked[89]. Used when the bulb is sprouting, it is prized as a vegetable[2].

tcanta None known  
dwatta None known

**propta** Seed - best sown as soon as it is ripe in a light sandy soil in pots in a cold frame[1]. The seed can also be sown in a cold frame in early spring[1]. Sow thinly because the seed usually germinates freely[1], within 1 - 6 months at 18°C[164]. Unless the seed has been sown too thickly, do not transplant the seedlings in their first year of growth, but give them regular liquid feeds to make sure they do not become deficient. Divide the small bulbs once the plants have died down, planting 2 - 3 bulbs per 8cm pot. Grow them on for another 2 years in a greenhouse or frame and plant them out into their permanent positions when dormant in late summer[K]. Plants take 3 - 4 years to flower from seed[200]. Division of the clumps after the leaves die down in spring[1, 200]. The bulbs can be replanted direct into their permanent positions if required.

**nwatta** Grows best on a gritty well-drained slope[42]. Plants succeed outdoors if they are given perfect drainage in a warm sunny position[200], otherwise they are better grown in a bulb frame[90]. Bulbs should be planted 5 - 7cm deep in the soil[79]. June is the best time to do this[245]. This species includes *C. edulis*, which is a synonym of *C. cancellatus damascenus*[42]. The corms are sold in local markets in Syria[89]. Plants tend to move considerably from their original planting place because of their means of vegetative reproduction, it is therefore wise not to grow different species in close proximity[1]. The flowers are only open during the day time, closing at night[245].

## 5.2.757 *Sedum kamschaticum*

Orange stonecrop, Kamschataka Sedum, Kamschataka Stonecrop

4 tlin 10 cyuc 1 kcaak 0 tcan 2 dwat 0.1 m hkuc htut cyutli hगत्युक्तुप hwicli hrasjlutnyik hpa7tli flatprikwiwis hpa7tmwatli fyifxre7t hjonli

**drutta** *Sedum kamschaticum* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and stems - cooked[105, 177, 179].

tcanta Plants can be grown as a ground cover when planted about 30cm apart each way[208].

**dwatta** *Anodyne Antiphlogistic Poultrice*The whole plant is anodyne and antiphlogistic. It stimulates the circulation[147]. A decoction is used in the treatment of traumatic injuries, bleeding cuts, burns and poisonous snakebites[147]. The fresh plant is crushed and applied externally to cuts, burns, traumatic injuries etc[218].

**propta** Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

**nwatta** Landscape Uses:Border, Container, Ground cover, Rock garden, Specimen. Succeeds in most soils[188] but prefers a fertile well-drained soil[200]. Requires a sunny position[188, 200]. A very drought tolerant plant once established[190, 200]. It can be grown in crevices on walls[219]. Hardy to about -15°C[200]. This species is closely related to *S. hybridum*[1] and *S. aizoon*[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, Not North American native, Naturalizing.

## 5.2.758 *Tricyrtis latifolia*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

**drutta** *Tricyrtis latifolia* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - cooked[105, 177].

tcanta None known  
dwatta None known

**propta** Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires 12 weeks stratification at 5°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division just before growth starts in spring to single crowns[175]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

**nwatta** Prefers a humus-rich fertile well-drained but moisture-retentive acid or neutral light sandy loam in partial shade[175, 200]. Prefers the dappled shade of a woodland garden but tolerates full sun if the soil is reliably moist throughout the growing season[200], flowering earlier in such a position. Plants require a sunnier position when growing in northern Britain[233]. This species is hardy to about -20°C, but if prolonged cold weather is not accompanied by snow cover the plants will appreciate a good mulch of organic matter[187]. Plants are very susceptible to attacks by slugs[175].

## 5.2.759 *Helenium hoopesii*

Owls Claws, Orange Sneezeweed  
4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.9 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Helenium hoopesi is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: GumA chewing gum is obtained from the roots[155, 257].

tcanta Dye Gum MiscellanyA yellow dye is obtained from the flowers[155]. They are usually boiled up with juniper ash to obtain the dye[244].

dwatta Miscellany StomachicThe plant is used as a remedy for vomiting[155, 257]. A snuff made from the crushed blossoms and the leaves of Psoralidium lanceolatum has been inhaled in the treatment of headaches and hay fever[257].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed it might be worthwhile trying a sowing in mid to late spring in situ outdoors[111]. Cuttings of soft wood from the base of the plant, June/July in a frame. Basal cuttings in spring[200]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[111]. This needs to be done fairly regularly because the clumps soon become congested[233]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container. Grows well in ordinary garden soil[1, 111], succeeding in most conditions other than boggy soils[233]. It prefers a fertile moisture retentive soil[200] in a sunny position[108, 111]. Dislikes dry soil[200]. This species is hardy to about -25°c[187]. Plants seem to be immune to the predations of rabbits[233]. A good bee and butterfly plant. Special Features:North American native, All or parts of this plant are poisonous, Suitable for cut flowers.

## 5.2.760 Mertensia oblongifolia

Oblongleaf bluebells

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Mertensia oblongifolia is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flow-ers - raw[172]. Leaves - raw or cooked[172]. The leaves are rather hairy and are not so nice when eaten raw[172].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[1, 200]. Sow stored seed as early in the year as possible. Protect from direct sunlight[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division, with care, in early spring or autumn[200].

nwatta Succeeds in an ordinary garden soil with some shade[1, 111]. A rather difficult plant to grow, it is best in a moist position[1].

## 5.2.761 Lysimachia barystachys

Manchurian yellow loosestrife

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lysimachia barystachys is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neu-tral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and stems - cooked[177].

tcanta None known

dwatta None known

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, succeeding in a moist loamy soil[1]. Most species in this genus seem to be immune to the predations of rabbits[233].

## 5.2.762 Potentilla erecta

Tormentil, Erect cinquefoil

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Potentilla erecta is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: TeaThe roots are extremely rich in tannin, long boiling converts this into a gum and it can then be eaten [115]. An emergency food, it is only eaten when all else fails[177]. A tea is made from the rhizomes[183].

tcanta Cosmetic Dye TanninA red dye is obtained from the roots[4, 66, 115]. The plant, and especially the root, is rich in tannin[4, 7]. It s used cosmetically as a compress to tone up flabby skin[7]. The root contains up to 20% tan-nin[238].

dwatta Antibiotic Antidiarrhoeal Astringent Dysentery Enuresis Haemostatic Hypoglycaemic OdontalgicContaining more tannin than oak bark, all parts of tormentil are strongly astringent, finding use wherever that action is required. This plant is considered to be one of the safest native astringents and it is widely used in herbal medicine in the treatment of diarrhoea, dysentery, sore throats etc[4, 238, 254]. The whole plant, and especially the root, is antibiotic, strongly astringent, haemostatic and hypoglycaemic[4, 7, 9, 21, 165]. It is used in the treatment of diarrhoea, dysentery, irritable bowel syndrome, colitis, ulcerative colitis etc[254]. Externally, the plant makes a good styptic for cuts etc., and a strongly made decoction has been recommended as a wash for mouth ulcers, infected gums, piles and inflamed eyes[4, 254]. Ex-tracts are used to treat chapping of the anus and cracked nipples[7]. The plant's effectiveness as a toothache remedy is undeniable and it has also been of benefit in treating bed-wetting by children[7].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We

Special Features: Not North American native, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil sur-face [2-1].

## 5.2.869 Philadelphus lewisii

Mock Orange, Lewis' mock orange

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 3.6 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flat-priklwisslip hpa7tmwatli xre7t hjonli

drutta Philadelphus lewisii is a deciduous Shrub growing to 3.6 m (11ft 10in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Soap WoodThe leaves and flowers are rich in saponins, when crushed and mixed with water they produce a lather that is an effective cleaner, used on the body, clothes etc[99, 169, 257]. You can wash your hands by merely pick-ing a couple of leaves or a bunch of blossom, wetting your hands and then rubbing the plant material vigorously as if it was a bar of soap[K]. This soap is a very gentle cleaner that does not remove the body's natural oils, but does remove dirt. It is not very effective against oil[K]. An infusion of the bark can also be used[99, 169]. The stems can be used in making fine coiled baskets[257]. Wood - strong, very hard. Used for tool handles[99].

dwatta Antihæmorrhoidal Antirheumatic Eczema Poul-tice SkinThe dried powdered leaves, or the powdered wood, has been mixed with pitch or oil and used as a rub on sores and swollen joints[257]. A poultice of the bruised leaves has been used to treat infected breasts[257]. A strained decoction of the branches, sometimes with the flowers, has been used as a soaking solution in the treatment of sore chests, eczema and bleeding hæmorrhoids[257].

propta Seed - best if given 1 months cold stratifica-tion[113]. Sow February in a light position in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent po-sitions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long side-shoots, July/August in a shaded frame. Plant out in spring. High per-centage[78]. Cuttings of mature wood of the current year's growth, 15 - 25cm with a heel, December in a sheltered bed outdoors. Fair to good percentage[78]. Layering in summer. Very easy.

nwatta An easily grown plant, succeeding in any moder-ately fertile soil, and also in thin soils over chalk[200]. Tol-erates poor soils[200]. Grows well in heavy clay soils. Suc-ceeds in semi-shade but prefers a position in full sun where it will flower more freely[182, 200]. Plants are hardy to about -15°c. Some named forms have been developed for their or-namental value[182]. Plants are very tolerant of pruning, one third of the stems can be cut down to the ground each year in order to promote fresh growth and heavier flowering[202]. A very ornamental plant with aromatic flowers[182, 200]. This plant is the State flower of Idaho[212].

## 5.2.870 Menispermum canadense

Canada Moonseed, Common moonseed

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 3.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Menispermum canadense is a deciduous Climber growing to 3.6 m (11ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male

or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is re-quired). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Bitter Diuretic Laxative Purgative TonicCanada moonseed has occasionally been used in the past for its medicinal virtues, though it is little, if at all, used in mod-ern herbalism. The roots are a bitter tonic, diuretic, laxative, nerving, purgative (in large doses), stomachic and tonic[4, 21, 46, 218]. A tea made from the root has been used in the treatment of indigestion, arthritis, bowel disorders and as a blood cleanser[222]. The root is applied externally as a salve on chronic sores[222]. Use with caution[21], see notes above on toxicity.

propta Seed - sow late winter in a greenhouse[78, 113]. Two months cold stratification speeds up germination[113] so it might be better to sow the seed as soon as it is ripe in a cold frame[K]. Germination is usually good[78]. When they are large enough to handle, prick the seedlings out into indi-vidual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent posi-tions in late spring or early summer, after the last expected frosts. Cuttings of mature wood, autumn in a frame[200]. Di- vision of suckers in early spring[78, 113]. The suckers can be planted out direct into their permanent positions, though we prefer to pot them up and grow them on in light shade in a greenhouse or cold frame until they are established[K].

nwatta Succeeds in any moderately fertile soil that does not dry out excessively in summer, in sun or partial shade[200]. Prefers a position in full sun[219]. This species is hardy to about -30°c, but, due to a lack of summer heat, the plants usually produce soft growth in mild maritime ar-eas and this can be cut to the ground at temperatures around -5 to -10°c[200]. The plants do not require pruning, but can benefit from being cut back to ground level every 2 - 3 years in order to keep them tidy[219]. A vigorous and fast-growing climbing plant that twines around supports, it also spreads freely by underground suckers[11, 182, 219]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.871 Cotoneaster simonsii

Simons' cotoneaster

4 tlin 8 cyuc 0 kcaak 2 tcan 0 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Cotoneaster simonsii is an evergreen Shrub growing to 3 m (9ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from May to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Dye Hedge HedgeA rose-tan dye is obtained from the fruit[168]. Can be grown as a medium to tall informal hedge[1, 11, 29, 200]. When close trimmed it makes an ex-cellent dense hedge[182].

dwatta None known

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germi-nate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°c and then 3 months cold stratification at 4°c[164]. The seed usually germinates within 1 - 18 months at 15°c but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle

one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Fuel Incense WoodThe cultivar 'Blue Carpet' can be used as a ground cover plant in a sunny position[188]. The wood is very fragrant, it is used as a fuel and an incense[51, 158, 272]. The leaves are used as incense[272].

dwatta SkinThe powdered plant is soaked for half an hour in water and then used for washing skin diseases[272].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Cascades, Erosion control, Ground cover, Massing, Rock garden. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11] and succeeding on chalk[200]. A drought tolerant plant once established, succeeding in hot dry positions[200]. This species is closely allied to *J. recurva*[11]. There are many named forms, selected for their ornamental value[188]. The type species is very slow growing in Britain[185] but the cultivar 'Meyeri' is somewhat faster and more successful. Dioecious. Male and female plants must be grown if seed is required. Special Features:Attractive foliage, Fragrant foliage, Not North American native, There are no flowers or blooms.

## 5.2.867 *Miscanthus x giganteus*

Giant Miscanthus

4 tlin 9 cyuc 0 kcak 4 tcan 0 dwat 4 m hkuc

htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Miscanthus x giganteus* is a PERENNIAL growing to 4 m (13ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta FodderCarbon Farming Solutions - Industrial Crop: biomass (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Very few perennial industrial crops have been properly domesticated. Those that have show significantly increased yields. *Miscanthus x giganteus* is partly domesticated [1-1]. An outstanding biomass producer in temperate climates needing very little nitrogen fertilizer. Most giant *Miscanthus* is used as biofuel but could also serve as a feedstock for any number of biobased materials [1-1]. Fodder: bank. A possible good candidate for contour hedgerows in agroforestry. An excellent wind break. A popular ornamental - Outstanding fall color with persistent winter interest.

dwatta None Known

propta Vegetative propagation methods are necessary since giant *Miscanthus* does not produce viable seed. Rhizomes

nwatta Fodder: Bank Industrial Crop: Biomass Management Hay New Perennial CropClimate: cold temperate to sub-

tropical. Humidity: humid. A sterile (non-invasive) hybrid of *M. sinensis* and *M. sacchariflorus*. A very fast growing to 4m in 15 months - but manageable plant. Dry to average water needs - sensitive to too much water on roots. Drought Tolerant. well-drained soil. Full sun. Carbon Farming Solutions - Cultivation: new crop. Management: hay (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 5.2.868 *Juniperus sabina*

Savine, Tam Juniper

4 tlin 7 cyuc 0 kcak 4 tcan 2 dwat 4 m hkuc

htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Juniperus sabina* is an evergreen Shrub growing to 4 m (13ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower in April, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta None known

tcanta Essential Hedge Hedge Insecticide Parasiticide RepellentLeaves are used as an insect repellent, a decoction of them is used against lice[46, 61]. An essential oil from the leaves and shoots has strong diuretic properties and is also used in perfumery[1, 61]. Yields of around 4% are obtained, this oil is also used as an insecticide[7]. A good dense ground cover plant, though it is slow to cover the ground[197]. The species type eventually forms a high ground cover, but there are many named forms that are lower-growing[208]. The sub-species *J. sabina tamariscifolia* has been particularly recommended[188]. Plants should be spaced about 1.2 metres apart each way[208]. The taller forms of this species make a good hedge[245].

dwatta Abortifacient Diuretic Emetic Emmenagogue Irritant Parasiticide WartsThe young shoots are abortifacient, diuretic, emetic, powerfully emmenagogue and irritant[4, 7]. The plant is rarely used internally but is useful as an ointment and dressing to blisters etc in order to promote discharge[4]. The powdered leaves are also used in the treatment of warts[1, 4, 7, 21]. The shoots are harvested in spring and dried for later use[4]. Use with great caution and never during pregnancy[4, 21]. See notes above on toxicity.

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Alpine garden, Erosion control, Ground cover, Massing, Rock garden. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11]. Prefers a limestone soil[1]. Succeeds in poor soils and in light shade[197]. Established plants are drought tolerant, succeeding in hot dry positions[200]. Tolerates maritime exposure[200]. A very ornamental plant[1], there are many named varieties[188]. All parts of the plant have a powerful pungent smell[245]. Plants can be dioecious or monoecious. Male and female plants must be grown if fruit and seed are required. The plant is sometimes attacked by *rust*, this is a fungus with an aecidial stage on the leaves of pear trees[1]. Plants are resistant to honey fungus[88].

have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers a light acid soil, disliking heavy and strongly calcareous soils[17]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.763 *Iris setosa*

Beachhead Iris, Canada beachhead iris, Wild flag

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 0.6 m hkuc

hmimhtut cyutli tucphja7n hwicli hrasjut hpa7tli flatprikhsnon hpa7tmwatli fyfikre7t hjonli

drutta *Iris setosa* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: RootEdible Uses: CoffeeRoot - yields an edible starch[2, 105, 177, 183]. Caution is advised, see the notes above on toxicity. Roasted and ground seed is a coffee substitute[46, 61, 183, 257].

tcanta DyeA dye is obtained from the petals, but the colour is not specified[257].

dwatta LaxativeA decoction of the root is used as a laxative[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done in September after flowering. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Massing, Specimen. Prefers a well-drained moist soil[79] but succeeds in most soils[42]. Dislikes lime and dry soils[42, 79]. The form from N. Hokkaido does not require an acid soil[187]. Cultivated for its edible root in Japan[2]. Many named forms have been selected for their ornamental value[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features:Attractive foliage, North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers.

## 5.2.764 *Cardamine raphanifolia*

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 0.5 m hkuc

pcimhmim cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfikre7t hjonli

drutta *Cardamine raphanifolia* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: We have no information on the edibility of this plant but the leaves are almost certainly edible[K].

tcanta Plants can be grown as a ground cover, making a fairly good carpet in a moist position[208].

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or

cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1]. Plants are closely related to *C. pratensis*[17].

## 5.2.765 *Arabis hirsuta*

Hairy rockcress, Mountain rockcress, Creamflower rockcress

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 0.6 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Arabis hirsuta* is a BIENNIAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies), insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta None known

dwatta None known

propta Seed - it is best to surface sow the seed as soon as it is ripe in a light position in a cold frame[134]. Seed can also be sown in spring. It usually germinates in 2 - 3 weeks at 21°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering[111]. Very easy, the divisions can be planted out straight into their permanent positions if required. Cuttings in a shady border in summer[11].

nwatta Easily grown in ordinary well-drained soil. Succeeds in dry soils and on walls[K].

## 5.2.766 *Dianthus barbatus*

Sweet William

4 tlin 10 cyuc 1 kcak 0 tcan 0 dwat 0.6 m hkuc

htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Dianthus barbatus* is a PERENNIAL growing to 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: The flowers have a mild flavour and are used as a garnish for vegetable and fruit salads, cakes, desserts, cold drinks etc[183].

tcanta None known

dwatta None known

propta Seed - sow May/June in a cold frame. The seed usually germinates in 2 - 3 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer or autumn[1]. The seed can also be sown thinly in an outdoor seedbed in late spring, the young plants being planted out in late spring or the autumn. Cuttings of half-ripe shoots, July in a frame[1]. Division in September[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Rock garden, Seashore, Specimen. Prefers a rich well-drained loamy soil in a sunny position, but succeeds in most soils including dry ones[1]. A very ornamental plant[1], its flowers are very

attractive to butterflies and moths[17, 30]. The flowers have a strong clove-like scent[245]. Plants self-sow freely when grown in a suitable position[1]. Although the Sweet William is a perennial species, it is quite short-lived and degenerates after its second year. It is best treated as a biennial in the garden[200]. Special Features:Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

### 5.2.767 *Mertensia paniculata*

Tall bluebells, Alaska tall bluebells, Northern bluebells, East-wood's bluebells  
4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.8 m hkuc  
hmmihmtu cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Mertensia paniculata* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flowers - raw[172]. Leaves - raw or cooked[172]. The leaves are rather hairy and are not so nice when eaten raw[172].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[1, 200]. Sow stored seed as early in the year as possible. Protect from direct sunlight[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division, with care, in early spring or autumn[200].

nwatta Easily grown in an ordinary garden soil with some shade[1, 111]. Prefers a deep moist but well-drained humus-rich soil in sun or semi-shade[200]. If the plant is cut down after flowering, it will normally produce another flush of flowers[233]. A very ornamental plant[233], it grows well in open woodland[200].

### 5.2.768 *Verbena officinalis*

Vervain, Herb of the cross, Prostrate verbena

4 tin 8 cyuc 1 kcak 0 tcan 3 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfixre7t hjonli

drutta *Verbena officinalis* is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from April to October, in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers LeavesEdible Uses: TeaLeaves - parboiled, seasoned and then eaten[183]. The leaves are used as a tea substitute[7, 183]. The flowers are used as a garnish[183].

tcanta None known

dwatta Analgesic Antibacterial Anticoagulant Antipruritic Antirheumatic Antispasmodic Antitumor Astringent Bach Birthing aid Depurative Diaphoretic Diuretic Dysentery Eczema Emmenagogue Galactagogue Stimulant Tonic VulneraryVervain, which has tonic and restorative properties, is sometimes used as a domestic herbal remedy. It is useful when taken internally in the treatment of headaches, fevers, nervous exhaustion, depression, gall bladder problems, insufficient lactation etc[4, 238]. It should not be given to pregnant women, though it can be used to assist contractions during labour[238]. Externally, it is used to treat minor injuries, eczema, sores, neuralgia and gum disease[238].

The leaves and flowering stems are analgesic, antibacterial, anticoagulant, antispasmodic, astringent, depurative, diaphoretic, mildly diuretic, emmenagogue, galactagogue, stimulant, tonic and vulnerary[4, 9, 21, 147, 165, 176, 218, 238]. The plant is harvested as flowering begins in the summer and dried for later use[7, 238]. Some remarkable results have been obtained when using this plant in the treatment of certain tumours, but further research needs to be carried out before definite claims can be made[7]. The root is astringent, it is used in the treatment of dysentery[218]. This species was ranked 12th in a Chinese survey of 250 potential antifertility plants[218]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Strain', 'Stress', 'Tension' and 'Over-enthusiasm'[209].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination should take place within 3 weeks. Prick out the seedlings into individual pots once they are large enough to handle and plant them out in early summer. If you have sufficient seed, it can also be sown in situ in late spring. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Basal cuttings in early summer: Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta A very easily grown plant, it succeeds in any moderately fertile well-drained but moisture retentive soil in a sunny position[1, 200]. Plants are very tolerant of neglect and will maintain themselves for a number of years even when growing in dense weed competition[K]. Self-sows freely when growing in a suitable position[K]. The growing plant attracts butterflies and moths[30].

### 5.2.769 *Trillium undulatum*

Painted Trillium

4 tin 8 cyuc 1 kcak 0 tcan 1 dwat 0.2 m hkuc  
pcimhmmihmtu cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta *Trillium undulatum* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. The young unfolding leaves make a good potherb[183].

tcanta None known

dwatta OxytoxicThe flowers, sepals and leaves have been eaten to accelerate the delivery of a child[257].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°C. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid

The bark also contains fraxetin. This has an inhibitory effect on the central nervous system, is a stronger and safer antidote than aspirin and has some antibacterial activity[176].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. A very ornamental plant[1]. This species might be dioecious, in which case male and female plants must be grown if seed is required.

### 5.2.864 *Clematis ligusticifolia*

White Clematis, Western white clematis, California clematis, 4 tin 8 cyuc 0 kcak 0 tcan 2 dwat 5 m hkuc  
hmmihmtu cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Clematis ligusticifolia* is a deciduous climber growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Fibre Hair Insulation Miscellany TinderThe seed floss makes an excellent tinder for starting fires, a spark from a flint will quickly ignite it[212]. The seed floss can be used as an insulation in shoes etc[212]. It has also been used in baby's nappies[257]. The stems have been used to make a string[257]. A shampoo made from the roots can be used as a hair shampoo[257].

dwatta Analgesic Contraceptive Eczema Febrifuge Miscellany Odontalgic Poultice Skin Stomachic Tonic VDWhite clematis was employed medicinally by a number of native North American Indian tribes who used it to treat a variety of complaints, but especially as an external application on sores etc[257]. It is rarely used in modern herbalism but probably merits investigation[K]. A decoction of the plant is used to treat colds and sore throats[212, 257]. It has also been used as a general tonic when feeling out of sorts[257]. An infusion of the white bark has been used as a febrifuge[213, 257]. An infusion of the roots has been used to treat headaches and stomach aches[257]. A poultice of the foliage has been used to treat chest pains and rheumatic joints[257]. An infusion of the plant has been used as a wash for skin eruptions, sores, wounds, backaches, swollen limbs, tired feet, syphilitic sores, eczema etc[257]. The stalks and roots have been used to make a woman's contraceptive[257]. A poultice made from the cut stems has been applied to the teeth for treating toothache[257]. A poultice of the mashed, moistened seeds has been applied to severe burns[257].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200].

Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.865 *Rhododendron campanulatum*

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 4.5 m hkuc  
hmmihmtu cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Rhododendron campanulatum* is an evergreen shrub growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Fuel MiscellanyAn excellent fuel wood is obtained from this plant[272].

dwatta MiscellanyThe leaves are mixed with tobacco and used as a snuff in the treatment of colds and headaches that affect only one side of the head[240]. The juice of the leaves is also used in the treatment of chronic rheumatism, sciatica and syphilis[240, 272]. The dried twigs and wood are used in the treatment of phthisis and chronic fevers[240].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in most humus rich lime free soils except those of a dry arid nature or heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. Requires a pH between 4.5 and 5.5[200]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. There are many named varieties selected for their ornamental value[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 5.2.866 *Juniperus squamata*

Flaky Juniper

4 tin 7 cyuc 0 kcak 0 tcan 1 dwat 4 m hkuc  
htut cyutli hगत्यuctcup hwicli hrasjlutnyik hpa7tli flatprikliwispil hpa7tmwatli nyanhjen hjonli

drutta *Juniperus squamata* is an evergreen shrub growing to 4 m (13ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only



growth. Takes 12 months[78]. Root cuttings, 6mm thick 25mm long in December. Plant horizontally in pots in a frame[78].

nwatta Prefers a deep loamy soil[1] but succeeds in most soils so long as they are not too shallow[202]. Succeeds in full or partial shade[188]. Plants flower more freely if their top-growth is in the sun[182]. Requires a humus-rich soil if it is to be at its best[219]. A rampant climber, it requires ample space and is best grown into an old tree[1, 200]. It climbs by means of twining and also by the young stems having prickles[182]. Plants do not normally require pruning[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants are dioecious, male and female plants must be grown if seed is required[200].

## 5.2.861 Cephalanthus occidentalis

Button Bush, Common buttonbush, Button Willow, Honey Bells, Buttonbush

4 tin 10 cyuc 0 kcaak 0 tcan 2 dwat 7 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Cephalanthus occidentalis is a deciduous Shrub growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None known  
tcanta WoodWood - light, tough. Of no commercial value[229].

dwatta Astringent Diaphoretic Diuretic Dysentery Emetic Febrifuge Laxative Malaria Odontalgic Ophthalmic TonicButton bush was often employed medicinally by native North American Indian tribes who used it to treat a range of ailments[257]. It is little used in modern herbalism. A tea made from the bark is astringent, emetic, febrifuge and tonic[61, 222]. A strong decoction has been used to treat diarrhoea and dysentery, stomach complaints, haemorrhages etc[257]. It has been used as a wash for eye inflammations[222]. A decoction of either the roots or the fruits have been used as a laxative to treat constipation[257] The leaves are astringent, diaphoretic, diuretic and tonic[61, 222]. A tea has been used to check menstrual flow and to treat fevers, kidney stones, pleurisy etc[222]. The plant has a folk reputation for relieving malaria[222]. The inner bark has been chewed in the treatment of toothaches[222].

propta Seed - we have no details on this plant but would suggest sowing the seed as soon as it is ripe in an acid compost in a cold frame. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of soft or semi-ripe wood, July in a frame[200]. Layering,

nwatta Landscape Uses:Border, Massing. An easily grown plant[1], it prefers an open position in a moisture retentive or wet neutral to acid humus-rich soil[200]. Dislikes dryness at the roots[11]. A calcifuge plant, it dislikes alkaline soils[200]. Requires a sunny position[184]. Plants are hardy to about -25°C[184]. A fast-growing but short-lived species in the wild[229]. The flowers, and the dried leaves, have a soft sweet fragrance like newly mown hay[245]. A good bee plant[149]. Plants are sometimes evergreen[200]. Special Features:North American native, All or parts of this plant are poisonous, Wetlands plant, Attracts butterflies, Fragrant flowers, Attractive flowers or fruits.

## 5.2.862 Lonicera sempervirens

Trumpet Honeysuckle, Coral Honeysuckle  
4 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 5 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lonicera sempervirens is an evergreen Shrub growing to 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in June.

The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta None known  
tcanta None known  
dwatta Antiasthmatic Cathartic Emetic StingsThe fruit is emetic and cathartic[207]. The expressed juice of the plant is beneficial in the treatment of bee stings[207]. The leaves have been dried and smoked as a treatment for asthma[213].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Landscape Uses:Arbor, Specimen. Succeeds in most soils but prefers a good moist soil in a sunny position[182]. Does not fruit so well when grown in the shade[200]. Plants are very hardy, tolerating temperatures down to -15°C or lower[260], though they can be deciduous in cold winters[219]. Special Features: Attracts birds, North American native, Wetlands plant, Attracts butterflies, Extended bloom season in Zones 9A and above, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 5.2.863 Fraxinus bungeana

Xiao Ye Qin  
4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 5 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli xre7t hjonli

drutta Fraxinus bungeana is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta None known  
tcanta Wax Weather protectionA commercial insect wax is produced on the branches[178]. We are not sure how the wax is produced, one report says that it is as a result of eggs being laid by insects. Another report says that the wax is produced by the plant due to the stimulation of the feeding insects. Yet another report says that the wax is produced from secretions of the insects[178]. The wax is used for making candles and as a polish for earthenware pots, book edges etc[178]. The plant (extract?) is said to be used as a barrier to protect the skin from ultra-violet light[176].

dwatta Analgesic Antiinflammatory Antitussive Diuretic Dysentery ExpectorantThe bark is analgesic, anti-inflammatory, antitussive, diuretic and expectorant[176, 238]. It controls bacterial infections and coughs[238]. It is used in the treatment of diarrhoea, dysentery, cataracts, cough and asthma[176]. The bark contains aesculin, this has anti-inflammatory, anticoagulant and analgesic actions[176].

soil[200]. This species is often found in quite acid soils, seldom in alkaline soils[270]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

## 5.2.770 Geranium incanum

Geranium, Cranesbill  
4 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Geranium incanum is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 9 and is not frost tender. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe leaves are a tea substitute[183].

tcanta None known  
dwatta None known  
propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Rock garden. Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Plants are not very hardy in Britain[200]. They tolerate occasional falls in temperature down to about -10°C, though if killed by cold they usually reappear from seed[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The plant often adopts a climbing habit, sprawling through scrub[187]. Special Features:Attractive foliage, Fragrant foliage, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Attractive flowers or blooms.

## 5.2.771 Trillium tschonoskii

4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.2 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Trillium tschonoskii is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit[105, 177]. No more details are given.

tcanta MiscellanyNone known  
dwatta MiscellanyThe root contains steroidal saponins, which have hormonal effects on the body[222, 238]. They are being used in gynaecological and obstetric medicine[238].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°C. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too

wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. This species is closely related to *T. kamtschaticum*[200]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

## 5.2.772 Spiraea betulifolia aemiliana

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Spiraea betulifolia aemiliana is a deciduous Shrub growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe leaves are a tea substitute[177, 183].

tcanta None known  
dwatta None known  
propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Hybridizes freely with other members of this genus[11].

## 5.2.773 Centaurea nigra

Black Knapweed, Lesser Knapweed  
4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli hgatkyutcup hwicli hysihrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Centaurea nigra is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: FlowersEdible Uses: Flower petals - raw. Added to salads[183].

tcanta None known  
dwatta Diaphoretic Diuretic TonicThe roots and seeds are diaphoretic, diuretic, tonic and vulnerary[4, 61]. The plant once had a very high reputation as a healer of wounds[4].

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. This should be done at least once every three years in order to maintain the vigour of the plant. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. Established plants are tolerant of considerable neglect, thriving and even self-sowing in dense weed growth[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.774 Arisaema dracontium

Green-Dragon

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc pcimhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwlati nyanhjen hjonli

drutta Arisaema dracontium is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: RootEdible Uses: Root. Considered to be edible once it has been dried, aged and elaborately processed[222]. The root contains calcium oxalate crystals - these are destroyed by drying the plant or by thorough cooking[K].

tcanta None known

dwatta Antiasthmatic Women's complaintsThe dried and aged root was used by the N. American Indians in the treatment of 'female disorders'[222, 257]. The plant (leaves?) were chewed in the treatment of asthma[213].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog garden, woodland garden or a sheltered border in semi-shade[90, 134, 200]. Prefers a loamy or peaty soil and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too hot or exposed[1, 200]. Tubers should be planted about 10cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

## 5.2.775 Pulmonaria saccharata

Jerusalem Sage, Bethlehem lungwort, Lungwort

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc pcimhmimhtut cyutli hgtaccup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwlati xre7t hjonli

drutta Pulmonaria saccharata is an evergreen Perennial growing to 0.3 m (1ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 3 and

is not frost tender. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

ckakta Edible Parts: Edible Uses: CondimentThe plant is said to be used as a spice[177, 183]. No more details are given.

tcanta A good ground cover plant for a shady position[188, 197]. Plants should be spaced about 60cm apart each way[208].

dwatta None known

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn or after flowering in early summer if the soil is not too dry[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Specimen, Woodland garden. Grows well in any moderately good soil including heavy clay soils[1, 31]. Prefers full to part shade in a moist humus rich soil[200]. Succeeds in the sunless shade of buildings[200]. Dislikes dry soils[200]. Plants growing in shady positions tolerate drought if the soil is rich in humus[190]. The leaves tend to wilt in hot weather when the plant is grown in full sun[190]. Hardy to about -20°C[187]. A very ornamental plant[233], it is semi-evergreen, forming small overwintering rosettes[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A valuable early nectar source for bees[200]. Plants seen growing in dappled shade at Hilliers Arboretum in April 1999 were self-sowing quite freely[K]. Hybridizes freely with other members of this genus[200]. There are many named varieties, selected for their ornamental value[200]. Special Features: Attractive foliage.

## 5.2.776 Trillium kamschaticum

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.3 m hkuc

pcimhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwlati xre7t hjonli

drutta Trillium kamschaticum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit[105]. No more details are given.

tcanta MiscellanyNone known

dwatta MiscellanyThe root contains steroidal saponins, which have hormonal effects on the body[222, 238]. They are being used in gynaecological and obstetric medicine[238].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°C. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade

can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

ckakta None known

tcanta Hedge Hedge WoodPlants can be grown as a tall hedge[200] They are very tolerant of clipping so long as this does not extend into the brown barked wood since trees cannot regenerate from this[200]. Any trimming should be done in the summer[200]. Wood - soft, not strong, close grained, very durable, easily worked, light, slightly fragrant. It weighs 211b per cubic foot. It is commonly used for woodenware, cooperage, fence posts, interior finish of houses etc[43, 46, 61, 82, 171, 235]. Wood found buried in swamps for hundreds of years is perfectly sound and not water-logged[11].

dwatta A decoction of the leaves has been used as a herbal steam for treating headaches and backaches[257]. A poultice made from the crushed leaves and bark has been applied to the head to treat headaches[257].

propta Seed - sow March/April in a seedbed outdoors[78]. The seed is best sown in pots in a frame[K]. Seed can take 18 months to germinate. One month warm then one month cold stratification has produced good results[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings in late summer or autumn in sandy soil in a cold frame[1, 11, 200]. Difficult, it may be best done in late winter to early spring[113].

nwatta Landscape Uses:Pest tolerant, Screen, Specimen. Succeeds in most soils and situations, but prefers abundant moisture and a deep loamy soil and a sheltered position[1, 11]. Grows well in heavy clay soils. Survives on dry alkaline soils[200]. Growth of trees is hardly affected by a lack of phosphate in the soil. Plants are moderately shade tolerant, especially when young[81, 200]. Plants are tolerant of atmospheric pollution according to one report[200], whilst another says that they do not do well in a polluted atmosphere[1]. This species is especially well adapted for planting in cold wet places[1]. Plants are hardy to about -35°C[200]. A long-lived tree in the wild with specimens more than 1,000 years old[229]. It is slow growing in cultivation[200], trees rarely grow more than 20cm in a year[185]. The branches become brittle with age[1]. A very polymorphic species, there are many named varieties[200]. The crushed foliage has a rather gingery hot aroma[185]. Favoured by many birds for roosting, high cover and especially for nesting, large specimens of this tree help to attract songbirds to the garden[200]. Trees are notably susceptible to honey fungus[200]. Special Features:Attracts birds, North American native, Wetlands plant, Inconspicuous flowers or blooms.

## 5.2.859 Phellodendron chinense

Chinese Cork Tree

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 10 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiwssilp hpa7tmwlati nyanhjen hjonli

drutta Phellodendron chinense is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

ckakta None known

tcanta None known

dwatta Antibacterial Bitter Cholagogue Diuretic Dysentery Expectorant Hypoglycaemic Ophthalmic Skin Stomachic Urinary VasodilatorThis species is used in Chinese herbalism in the same way as *P. amurense*[238, 254]. These uses

are as follows:- Amur cork tree, called Huang Bai in China, is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs, but one that should be used with care[218, 254]. A strongly bitter remedy, the bark acts strongly on the kidneys and is regarded as a detoxicant for hot damp conditions[238]. Recent research has shown that the plant is useful in the treatment of meningitis and conjunctivitis[254]. Huang Bai should only be used under professional supervision and should not be taken during pregnancy[254]. The bark is alterative, antibacterial, antirheumatic, aphrodisiac, bitter stomachic, cholagogue, diuretic, expectorant, febrifuge, hypoglycaemic, ophthalmic, skin, vasodilator and tonic[4, 61, 174, 176, 178, 281, 238]. It is taken internally in the treatment of acute diarrhoea, dysentery, jaundice, vaginal infections including Trichomonas, acute urinary tract infections, enteritis, boils, abscesses, night sweats and skin diseases[238, 254]. It is commonly used in conjunction with *Scutellaria baicalensis* and *Coptis chinensis* in a preparation called 'injection of three yellow herbs'[238]. It is given intramuscularly for upper respiratory tract infections[238]. The bark of 10 year old trees is harvested in the winter or spring and dried for later use[238, 254]. The fruit is expectorant[218].

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 2 months cold stratification, sow in late winter in a cold frame[78, 113]. Germination is usually good. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Pot up in autumn and over winter in a cold frame. Fair to good percentage[78]. Root cuttings - obtain in December and store in leafmold in a warm place for 3 weeks. Cut into 4cm lengths and plant horizontally in pots. Grow on in a warm greenhouse. Good percentage[78].

nwatta Prefers a moisture retentive well-drained deep rich loam in full sun[11, 200]. Prefers a neutral to alkaline soil[238]. Succeeds on shallow chalky soils[245]. Grows best in areas with long hot summers[200]. Plants are gross feeders and require a rich soil if they are to perform well[11]. Dormant plants are fully hardy in Britain, tolerating temperatures down to at least -20°C[188, 200], but the young growth is liable to damage from late spring frosts[11, 188, 200]. The leaves are aromatic[188]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.860 Celastrus angulatus

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 7.3 m hkuc

pcimhmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwiw hpa7tmwlati nyanhjen hjonli

drutta Celastrus angulatus is a deciduous Climber growing to 7.3 m (24ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from November to February. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta None known

tcanta InsecticideThe plant has insecticidal properties[218].

dwatta CancerMany plants in this genus contain compounds of interest for their antitumour activity[218].

propta Seed - gather when ripe, store in dry sand and sow February in a warm greenhouse[78]. Three months cold stratification leads to a higher germination rate[113]. Remove the flesh of the fruit since this inhibits germination[113]. Germination rates are usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[188]. Layering in August of the current seasons

nwatta Landscape Uses:Screen. Succeeds in most soils and situations, but prefers a moist deep loamy soil and a sheltered position[1, 11]. Grows well in heavy clay soils. Survives on dry alkaline soils[200]. Does not grow well on peat or shallow chalky soils[11]. Growth of trees is hardly affected by a lack of phosphate in the soil. Plants are moderately shade tolerant, especially when young[81, 200]. Plants are tolerant of atmospheric pollution according to one report[200], whilst another says that they do not do well in a polluted atmosphere[1]. Plants are hardy to about -35c, they also tolerate low summer temperatures[200]. A very polymorphic species, there are many named varieties[200]. This species establishes well and grows fairly quickly when young[11]. Trees can reach 20 metres tall in 35 years but growth slows as the trees get older[185]. It is cultivated as a timber tree in Europe[50]. Trees in the wild can live for 1,000 years or longer[226], one specimen is believed to be 3,500 years old[229]. This longevity is probably due to the presence of toxic chemical compounds from microscopic fungi concentrated in the heartwood[226]. The wood and foliage have an acrid odour[226]. The bruised foliage releases a smell of turpentine[245]. Favoured by many birds for roosting, high cover and especially for nesting, large specimens of this tree help to attract songbirds to the garden[200]. Trees are notably susceptible to honey fungus[200]. Special Features:North American native, Inconspicuous flowers or blooms.

### 5.2.856 Campsis radicans

Trumpet Vine, Trumpet creeper

4 tlin 10 cyuc 0 kcaak 1 tcan 1 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Campsis radicans is a deciduous Climber growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from June to October, in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Can be used as a ground cover plant in a sunny position[188]. They can be allowed to scramble on the ground and will form an effective ground cover, rooting at intervals along the branches[208]. They should be planted about 2.5 metres apart each way[208]. The form C. radicans f. flava has gained the Royal Horticultural Society's Award of Garden Merit.

dwatta Diaphoretic VulneraryThe root is diaphoretic and vulnerary[61, 218].

propta Seed - sow spring in a greenhouse at 10°c. Two months stratification at 5°c assists germination[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of almost ripe wood, 7 - 10cm long, July/August in a frame. Slow to root but a fair percentage[78, 200]. Root cuttings 5cm long in December. Fair to good percentage[78]. Suckers, removed in the dormant season.

nwatta Landscape Uses:Arbor, Seashore, Woodland garden. Succeeds on a warm wall in a good loamy soil[1] in full sun[166] or light shade[200]. Plants can become rampant when growing in rich soils[200]. A very ornamental plant[1], it is hardy to about -20°c according to some reports[184, 200] whilst another says that it is not hardy in all parts of the country but it succeeds in more open positions such as a pergola or an old tree in the southern part of England[1]. Plants require the extra warmth of a sunny wall to induce better flowering[184]. Plants are self-clinging by aerial roots like ivy but are best if given some support[1, 166]. Any pruning is best done in the spring[188]. The seed only ripens outdoors in Britain in hot summers[11]. There are some named forms selected for their ornamental value[202]. Hybridizes freely with other members of this genus[200]. Special Features: Attracts birds, North American native, Invasive, All or parts of this plant are poisonous, Attracts butterflies, Attractive flowers or blooms.

### 5.2.857 Rhus potaninii

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli nyanhjen hjonli

drutta Rhus potaninii is a deciduous Tree growing to 12 m (39ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known tcanta Dye Ink Mordant OilThe leaves are rich in tannin. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. An indelible black ink is obtained from galls on the leaves[46, 61]. The report does not say if the galls are used before or after the insect leaves them.

dwatta Antiseptic Astringent HaemostaticAn excretion produced on the leaf by an insect Melaphis chinensis or M. paitan is antiseptic, astringent and haemostatic[176]. It is used in the treatment of persistent cough with blood, chronic diarrhoea, spontaneous sweating, night sweats, bloody stool, urorrhoea and bloody sputum. It is used applied externally to burns, bleeding due to traumatic injuries, haemorrhoids and ulcers in the mouth[176].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. The young growth in spring can be damaged by late frosts. A very ornamental plant[1], but it rarely flowers in Britain[11]. This species is very closely related to R. punjabensis[109]. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, Toxicodendron, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.858 Chamaecyparis thyoides

White Cypress, Atlantic white cedar, Coast White Cedar, Southern White Cedar, White Cypress

4 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 10 m hkuc hmimhtut cyutli kyuctcuphja7n hwicli hrasjlutnyikfrip hpa7tli frusflatprikliwsslip hpa7tmwatli hjonli

drutta Chamaecyparis thyoides is an evergreen Tree growing to 10 m (32ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from March to April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes

in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

### 5.2.777 Polygonum persicaria

Red Leg, Spotted ladysthumb

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Polygonum persicaria is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves and young shoots - raw or cooked[55, 62, 105, 183]. They contain about 1.9% fat, 5.4% pectin, 3.2% sugars, 27.6% cellulose, 1% tannin[178]. Seed - raw or cooked. It is rather small and fiddly to utilize.

tcanta DyeA yellow dye is obtained from the plant when alum is used as a mordant[207].

dwatta Astringent Diuretic Lithotropic Poultrice Rubefacient VermifugeThe leaves are astringent, diuretic, rubefacient and vermifuge[9, 21, 53, 178, 222]. An infusion has been used as a treatment for gravel and stomach pains[257]. A decoction of the plant, mixed with flour, has been used as a poultice to help relieve pain[257]. A decoction of the plant has been used as a foot and leg soak in the treatment of rheumatism[257]. The crushed leaves have been rubbed on poison ivy rash[257].

propta Seed - sow spring in situ.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment[1]. Plants seem to be immune to the predations of rabbits[233].

### 5.2.778 Lithospermum ruderale

Western Gromwell, Western Stoneseed

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Lithospermum ruderale is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: The seeds have been used for food[257].

tcanta Beads DyeThe plant has been used as a dye and body paint[238]. No more details are given in the report, but it is likely that the root is used and the colour is some shade of red[K]. The hard, white, shiny seeds have been used as beads[257].

dwatta Antirheumatic Astringent Contraceptive Diuretic KidneyAn infusion or decoction of the root has been used as a diuretic in the treatment of kidney complaints and also to treat internal haemorrhaging, diarrhoea etc[61, 257]. A poultice of the dried powdered leaves and stems has been used to relieve the pain of rheumatic joints[257]. Some N. American Indian women drank a cold water infusion of the roots daily for six months to ensure permanent sterility[213]. Alcoholic extracts of the plant have been shown to eliminate

the oestrus cycle and decrease the weight of the thymus and pituitary glands[213].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Prefers a sunny position in a moderately fertile well-drained soil[200].

### 5.2.779 Bromus carinatus

Californian Brome

4 tlin 8 cyuc 1 kcaak 1 tcan 0 dwat 0.8 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

drutta Bromus carinatus is a ANNUAL/BIENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind, Cleistogomy is self-pollinating without flowers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[161, 177]. Used as a piñole[183]. The dried seed can be ground into a powder and mixed with water to make a mush or made into bread[257]. The seed is rather small and fiddly to utilize[K].

tcanta Used for control of erosion and revegetation of damaged land, as well as a highly palatable forage for livestock.

dwatta None known

propta Seed - sow spring or autumn in situ and only just cover. Germination should take place within 2 weeks. If seed is in short supply it can be surface sown in a cold frame in early spring. When large enough to handle, prick out the seedlings into individual pots and plant them out in early summer. Division in spring. Large clumps can be planted out direct into their permanent positions whilst it is best to pot up smaller clumps and grow them on in a cold frame until they are ready to be planted out.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. A potential perennial cereal crop, it is able to survive summer droughts without needing irrigation[183]. Tolerates a pH in the range 5.3 to 7.8. The plant has cleistogamous flowers - these do not open in the usual way but are self-pollinated by the plant. The following notes are based on the general needs of the genus. Succeeds in a sunny position in most well-drained soils[138, 200].

### 5.2.780 Gentiana pannonica

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Gentiana pannonica is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta The root is sometimes used in the manufacture of gentian bitters[183].

tcanta None known

dwatta Antihelmintic Antiinflammatory Antiseptic Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Stomachic TonicThis species is one of several that are the source of the medicinal gentian root[4], the following notes are based on the general uses of G. lutea which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and

is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division of older plants in March[111, 239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species is not particular about soil type, so long as it is deep enough to accommodate the plant's roots[239]. Although sometimes found wild on alkaline soils, it prefers a neutral to slightly acid soil in cultivation[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. This species is closely related to *G. punctata* and *G. purpurea*[239]. Plants are intolerant of root disturbance[200]. The flowers have the scent of the old tea rose[245].

## 5.2.781 Campanula rotundifolia

Harebell, Bluebell bellflower  
4 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.4 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasjlit hpa7tli prikwiw hpa7tmwatli fyifxre7t hjonli

drutta *Campanula rotundifolia* is a PERENNIAL growing to 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Leaves - raw or cooked[K].

tcanta None known

dwatta The root has been chewed in the treatment of heart and lung problems[257]. An infusion of the roots has been used as ear drops for a sore ear[257]. A decoction of the plant has been drunk or used as a wash in the treatment of sore eyes[257].

propta Seed - surface sow in spring in a cold frame. Three or four weeks pre-chilling of the seed improves the germination rate[138]. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can also be sown outdoors in situ during the spring. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[111]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Landscape Uses:Border, Container, Massing, Rock garden, Seashore, Specimen. A very easily grown plant, it succeeds in most fertile well-drained soils[233, 271], though it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Succeeds in poor soils[17]. This species can be naturalized in finer turfs, on grassy banks and in chalk downland and heath associations[200]. Plants are hardy to at least -15°C[200]. A very variable species in the wild[271]. When established, plants can spread fairly freely and also self-sow, though they are quite easily contained by hoeing[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very ornamental plant, there are some named varieties[200]. Special Features:Attractive foliage, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers.

## 5.2.782 Ophioglossum vulgatum

Adder's Tongue, Southern adderstongue  
4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlitnyik hpa7tli flatprikwiw hpa7tmwatli hjonli

drutta *Ophioglossum vulgatum* is a FERN growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen from May to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Used as a vegetable[145]. No more details are given.

tcanta None known

dwatta Emetic Skin VulneraryThe root and the leaves are antiseptic, detergent, emetic, haemostatic, styptic and vulnerary[4, 61, 218]. An ointment made from the plant is considered to be a good remedy for wounds and is also used in the treatment of skin ulcers[4, 145]. The expressed juice of the leaves is drunk as a treatment for internal bleeding and bruising[4].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep them in humid conditions until they are well established. Do not plant outside until the ferns are at least 2 years old. Division of underground rhizomes with care because the roots are brittle[200]

nwatta Prefers a moist free-draining soil[1]. Plants are hardy to about -15°C[200]. The prothalli (a small plant formed when the spore germinates) of this species form a symbiotic relationship with a mycorrhizal fungus in much the same way as orchid seedlings[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants can be hard to establish, they can be naturalized in a meadow

erosion along the banks of rivers etc[226]. It is also a good pioneer species, readily invading any cleared-out area if there is sufficient moisture[226, 229]. It is short-lived and not very shade tolerant and so, having provided good conditions for other woodland trees to become established, it is eventually out-competed by them[K]. Wood - light, close-grained, soft, weak[82, 226, 229, 235]. It weighs 28lb per cubic foot[235]. It is sometimes cut for timber which is used for fence posts, but its uses are mainly limited to charcoal and firewood[226, 229]. Dynamic accumulator.

dwatta Anodyne Antispasmodic Astringent FebrifugeAn infusion of the bark shavings has been used in the treatment of diarrhoea and stomach ailments[257]. A poultice of the bark has been applied to bleeding cuts[257]. A decoction of the branch tips has been used as a soak for treating cramps in the legs and feet[257]. The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. A fast-growing but relatively short-lived species in the wild[229]. A good bee plant, providing an early source of nectar[11]. Trees are impatient of root disturbance and should be moved regularly before being planted in their permanent positions, which is best done whilst the plants are young[11]. The root system is rather aggressive and can cause problems with drains[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 5.2.854 Juniperus chinensis

Chinese Juniper, Sargent juniper  
4 tin 10 cyuc 0 kcaak 0 tcan 2 dwat 15 m hkuc  
htut cyutli kyuctcup hwicli hrasjlitnyik hpa7tli flatprikwiw hpa7tmwatli nyanhjen hjonli

drutta *Juniperus chinensis* is an evergreen Tree growing to 15 m (49ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in April, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta Parasiticide ParasiticideA number of cultivars are suitable for use as a ground cover, though they are rather slow-growing[208]. They should be spaced about 90cm apart each way[208]. 'Parsonsii' can grow up to 2 metres across, with its branches horizontal to and about 5cm above the ground but never touching the ground[208].

dwatta Antirheumatic Haemostatic Hepatic Parasiticide Parasiticide ResolventThe stems are used in the treatment of parasitic skin problems and rheumatism[218]. The fruit is used in the treatment of convulsions, excessive sweating and hepatitis[218]. The root is used in the treatment of burns and scalds[218]. The resin, mixed with the resin of *Pinus* species, is used as a resolvent on tumours[218].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may

speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Screen. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11, 200]. Succeeds in chalky soils[200]. Established plants are drought tolerant, succeeding in hot dry positions[200]. A slow growing and rather short-lived tree[185]. The plants produce new growth from early May to the end of August and can make 50cm a year increases in height when young[185]. A very ornamental plant[1], there are many named varieties[200]. The crushed foliage has a rather sour resinous scent[185]. Trees are usually dioecious but occasional monoecious trees occur[11]. Male and female flowers are required if fruit and seed is to be produced. Special Features: Fragrant foliage, Not North American native, Inconspicuous flowers or blooms.

## 5.2.855 Chamaecyparis nootkatensis

Nootka Cypress, Nootka Cypress, Yellow Cypress, Alaska Cedar

4 tin 8 cyuc 0 kcaak 0 tcan 1 dwat 15 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlitnyikfrip hpa7tli flatprikwiw hpa7tmwatli hjonli

drutta *Chamaecyparis nootkatensis* is an evergreen Tree growing to 15 m (49ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from March to April, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta None known

tcanta Fibre Hedge Hedge Miscellany Tinder Wood-Plants can be grown as a tall hedge[200] They are very tolerant of clipping so long as this does not extend into the brown barked wood since trees cannot regenerate from this[200]. Any trimming should be done in the summer[200]. The fibre of the inner bark is fine and soft, it is pounded and spun then used for making blankets, clothing, caps, mats etc[99, 226, 257]. Torn into pieces, it can be used as bandages or for washing babies[226]. The finely shredded inner bark can be used as a tinder[257]. Wood - hard, very durable, fragrant with an agreeable resinous odour, close grained, has low-shrinkage, is somewhat brittle, but does not splinter. Easily worked, it is used for carving, cabinet work, making boats, implements etc[1, 46, 61, 82, 99, 171, 226].

dwatta Antirheumatic Miscellany Poultice SkinThe plant has been used in sweat baths for treating rheumatism and arthritis[257]. An infusion of the branch tips has been used as a wash for sores and swellings[257]. A poultice of the crushed leaves has been applied to sores[257]. The soft bark has been used as a cover for poultices[257].

propta Seed - sow March/April in a seedbed outdoors[78]. The seed is best sown in pots in a frame[K]. Seed can take 18 months to germinate. One month warm then one month cold stratification has produced good results[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings in late summer or autumn in sandy soil in a cold frame[1, 11, 200]. Difficult, it may be best done in late winter to early spring[113].

Wetlands plant, Attracts butterflies, Inconspicuous flowers or blooms.

### 5.2.851 Populus 'Balsam Spire'

Tacatricho 32

4 tin 8 cyuc 0 ckak 2 tcan 3 dwat 30 m hkuc htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli nyanhjen hjonli

drutta Populus 'Balsam Spire' is a deciduous Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Pot-pourri Rooting hormone Shelterbelt WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. The dried buds are used in pot-pourri[238]. Wood - soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion. Of low quality, it is mainly used as a source of pulp[11, 46].

dwatta Anodyne Antiinflammatory Antiscorbutic Antiseptic Balsamic Diuretic Expectorant Refrigere Stimulant TonicThe leaf buds are covered with a resinous sap that has a strong turpentine odour and a bitter taste[213]. They also contain salicin. The buds are antiscorbutic, antiseptic, balsamic, diuretic, expectorant, stimulant and tonic[4, 21, 57, 165, 238]. They are taken internally in the treatment of bronchitis and upper respiratory tract infections. They should not be prescribed to patients who are sensitive to aspirin[238]. Externally, the buds are used to treat colds, sinusitis, arthritis, rheumatism, muscular pain and dry skin conditions[238]. They can be put in hot water and used as an inhalant to relieve congested nasal passages[213]. The buds are harvested in the spring before they open and are dried for later use[238]. Although no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. This species is a hybrid and will not come true from seed. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy, the cuttings grow away strongly and can be 2 metres tall by the end of their first year[K]. Suckers in early spring[78].

nwatta An easily grown plant, it grows well in a heavy cold damp soil[1]. It prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. Reasonably wind tolerant, though it does not do well in exposed upland sites or in maritime exposure[11, K]. It dislikes shady positions, and is intolerant of root or branch competition[200]. A very fast growing hybrid, this plant is a female clone that is sometimes planted for forestry[11]. It comes into leaf early in the year[11]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown

on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required.

### 5.2.852 Betula schmidtii

Schmidt's Birch

4 tin 8 cyuc 0 ckak 3 tcan 0 dwat 30 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli hjonli

drutta Betula schmidtii is a deciduous Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta WoodWood - hard, heavy (it does not float). Used for rollers, mallets etc[151].

dwatta Antiseborrheic UrinaryThe German Commission E Monographs, a therapeutic guide to herbal medicine, approve Betula species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Succeeds in a well-drained loamy soil in a sheltered position[11, 200]. Grows well in heavy clay soils. Dislikes wet soils[200]. Shade tolerant[200]. Hybridizes freely with other members of this genus[50]. Trees are succeeding very well at Kew[11]. Trees are notably susceptible to honey fungus[200].

### 5.2.853 Salix amygdaloides

Peach Leaved Willow

4 tin 8 cyuc 0 ckak 3 tcan 2 dwat 20 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix amygdaloides is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Basketry Charcoal Dye Pioneer Soil stabilization Tannin WoodThe bark is a source of tannin[226]. A light brown dye is obtained from the bark[226]. The young stems are very flexible and can be used in basket making[257]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The tenacious root system of this tree makes it very useful for preventing soil

or cultivated in the border where they should be left undisturbed[200]. Unlike most species of ferns, the fronds of this species grow up straight and not curled inward, crozier fashion[4].

### 5.2.783 Festuca ovina

Sheep's Fescue

4 tin 8 cyuc 1 ckak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Festuca ovina is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed[105, 161]. No further details but the seed is rather small and would be very fiddly to utilise[K].

tcanta None known

dwatta None known

propta Seed - sow spring in situ[162]. The seed usually germinates within three weeks. Division in spring[162]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Prefers a light well-drained soil in full sun[200]. A drought resistant plant once established[1], it succeeds on shallow chalky soils[61]. Tolerant of constant cutting, this plant is often grown in lawns[1].

### 5.2.784 Artemisia glacialis

Glacier Wormwood

4 tin 8 cyuc 1 ckak 0 tcan 2 dwat 0.2 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Artemisia glacialis is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentThe herb is used as a flavouring in vermouth and liqueurs[183].

tcanta None known

dwatta Digestive Expectorant Sedative StomachicGlacier wormwood has similar medicinal properties to common wormwood, A, absinthum[7]. It is used locally where it grows wild. The whole plant is digestive, expectorant, sedative and stomachic[7]. An infusion of the herb has a marked effect upon mountain sickness[7]. A poultice of the plant is used as a first-aid remedy in the treatment of wounds[7].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about 10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Requires a very well-drained light or medium soil and a sunny position[190]. Very intolerant of winter wet[190]. Established plants are drought tolerant[190]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Indiscriminate collection of this plant from the wild has made it an endangered species[7]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.785 Sedum acre

Common Stonecrop, Goldmoss stonecrop, Gold Moss Sedum 4 tin 9 cyuc 1 ckak 0 tcan 2 dwat 0.1 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum acre is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: CondimentLeaves - raw or cooked[13, 100]. Rich in vitamin C, but it has a bitter acrid taste[1, 244]. The main interest in the edible qualities of this plant is as a survival food, since it grows wild in the driest deserts as well as in arctic conditions[244]. Large quantities can cause stomach upsets[19]. It is best to dry the leaves (which can be difficult because they are very fleshy) and then powder them and use them to add a peppery taste to foods[244]. The leaves are dried and ground into a powder to make a spicy seasoning[183].

tcanta The plant spreads aggressively and can be used for ground cover in a sunny position amongst plants tall enough not to be overrun by it. Many species of the stronger-growing bulbs such as lilies can grow successfully through it[K].

dwatta Astringent Foot care Hypotensive Laxative Rubefacient Vermifuge Vitamin C VulneraryThe herb is astringent, hypotensive, laxative, rubefacient, vermifuge and vulnerary[4, 7, 9, 13, 46]. It is considered to be a useful medicinal plant by some herbalists, though others do not use it because of the violence of its operation when taken internally[4, 7]. One of its best uses is as an effective and harmless corn-remover, it can also be used to bring boils to a head, though this can also cause some local irritation[7]. The bruised fresh plant is applied as a poultice to wounds and minor burns[9], though some care should be exercised because the plant can cause blisters or skin irritations[244]. The herb is difficult to dry and so is best used when fresh, it can be gathered at any time during the spring and summer[7]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of piles and anal irritations[9].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. It can also be sown in the autumn in a cold frame, some seed germinates immediately whilst others germinate in the spring. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Container, Ground cover, Rock garden, Seashore, Specimen. A very easily grown plant, it succeeds in most soils[188] but prefers a sunny position in a fertile well-drained soil[200]. Established plants are drought tolerant[190]. Grows well on walls[190]. Plants can be very aggressive and invasive, spreading freely at the roots[200]. If clearing the plant from an area it is quite important to try and remove every part of the plant since even a small part of the stem, if left in the ground, can form roots and develop into a new plant[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, Not North American native, Invasive, Naturalizing.

## 5.2.786 *Gentiana scabra buergeri*

4 tlin 8 cyuc 1 kcaok 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Gentiana scabra buergeri* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant and old leaves - cooked[105]. A famine food, used when all else fails[177, 179].

tcanta None known

dwatta Anodyne Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Eczema Emmenagogue Expecto- rant Febrifuge Pectoral Refrigerant Stomachic Tonic UrinaryThe root is antibacterial and stomachic[176]. It is used in the treatment of jaundice, leucorrhoea, eczema, conjunctivitis, sore throat, acute infection of the urinary system, hypertension with dizziness and tinnitus[176]. The root is harvested in the autumn and dried for later use. This species is one of several that are the source of the medicinal gentian root[4], the following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Spores - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200].

This species is happy in any reasonable soil[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. A very ornamental plant[1]. Plants are intolerant of root disturbance[200].

## 5.2.787 *Polystichum aculeatum*

Hard Shield Fern

4 tlin 8 cyuc 1 kcaok 0 tcan 0 dwat 0.8 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Polystichum aculeatum* is an evergreen Fern growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen from July to August. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Eaten in curries[177]. We have no more details, it is probably the young leaves that are used though it might be the root.

tcanta Plants can be grown as a ground cover and are best placed about 60cm apart each way[208].

dwatta None known

propta Spores - best sown as soon as they are ripe, though they can also be sown in the spring. Sow them on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division. This is best done in the spring.

nwatta Very hardy and easily grown in light shade in any reasonable soil[187]. Prefers a sandy humus-rich soil in a shady position that is moist even in winter[1]. Tolerates part sun for up to 6 hours a day if the soil remains moist[200]. Prefers a pH in the range 6.5 to 7.5[200]. A very ornamental plant[1]. Members of this genus are rarely if ever troubled by browsing deer[233]. Remove old fronds from the plant in the spring because they may harbour fungal diseases[200]. Some named forms have been selected for their ornamental value[187].

## 5.2.788 *Lycopodium lucidulum*

Shining Club Moss

4 tlin 8 cyuc 1 kcaok 0 tcan 0 dwat 0.2 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Lycopodium lucidulum* is a FERN growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: The plant is edible[161, 177].

tcanta MordantThe plant can be used as a mordant in dyeing[172].

dwatta None known

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. The spores are generally produced in abundance but are difficult to grow successfully[200]. Layering of growing tips[200].

nwatta Thrives in a rough spongy peat in a shady position[1]. Requires a humid atmosphere[200]. Terrestrial members of this genus are hard to establish. The roots are delicate and liable to rot, most water being absorbed through the foliage[200]. Members of this genus are rarely if ever

nwatta A very easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. This species is fairly wind resistant, though it does not do well in exposed upland sites[11]. It dislikes shade and is intolerant of root or branch competition[200]. A very fast growing tree, it grows for a longer period in the season than other poplars. This hybrid species contains a number of named forms, several of which have been selected for their ornamental value[11, 200]. Many of them are fast growing trees that are used in forestry and for shelterbelts[11, 200]. 'Serotina' and 'Robusta', in particular, are often used in shelter belt plantings. 'Serotina' is a male that responds well to pollarding but is slower in growth than some other cultivars[11]. 'Robusta' is a male and is frequently grown in forestry, as a screen and in shelterbelts[11]. The var. 'Regenerata' is tolerant of urban pollution[200]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

## 5.2.849 *Populus x canescens*

Grey Poplar

4 tlin 9 cyuc 0 kcaok 2 tcan 1 dwat 30 m hkuc htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Populus x canescens* is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from February to March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta Shelterbelt WoodA fast growing tree, tolerant of salt winds, it can be grown in a shelterbelt[200]. Wood - soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11].

dwatta Anodyne Antiinflammatory FebrifugeAlthough no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. This species is a hybrid and will not come true from seed. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78]. Layering[200]. Root cuttings in winter[200].

nwatta An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11,

200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. Plants are reasonably wind tolerant, though they do not grow well in exposed upland sites[11]. They also tolerate salt-laden winds but not saline soils[200]. They dislike shade and are intolerant of root or branch competition[200]. This species is a spontaneous natural hybrid, *P. alba* x *P. tremula*[200]. There are several named forms selected for their ornamental value[200]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

## 5.2.850 *Taxodium distichum*

Swamp Cypress, Bald cypress, Common Bald Cypress

4 tlin 10 cyuc 0 kcaok 0 tcan 1 dwat 30 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli flatprikliwssilphsom hpa7tmwatli hjonli

drutta *Taxodium distichum* is a deciduous Tree growing to 30 m (98ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water. It can tolerate atmospheric pollution.

kcakta None known

tcanta Fibre WoodThe bark has been used to make cordage[257]. Wood - light, soft, not strong, moderately hard, easily worked, straight grained, very durable in damp soil, takes a good polish. It weighs 28lb per cubic foot[227]. The wood is not given to excessive warping or shrinking[227], it is used for construction, water pipes, vats etc[1, 46, 61, 82, 149, 171, 227].

dwatta AnalgesicThe resin in the cones is used as an analgesic for wounds[149, 227].

propta Seed - sow late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If sowing a lot of seed you could sow it in early spring in an outdoor seedbed[78]. Allow the plants to grow on in the seedbed for two years and then plant them into their permanent positions in late autumn or early spring. Cuttings in the late summer.

nwatta Landscape Uses:Firewood, Pest tolerant, Massing, Screen, Specimen, Street tree. Although this plant can be grown in wet soils and shallow water, it thrives in any soil and trees actually grow faster in normal unflooded soils[81]. Established plants succeed in standing water up to 60cm deep[200] - in such a situation the roots develop 'knees', curious cone-shaped structures that grow above the ground[227]. Tolerates the high pH of chalk streams[200]. Tolerates atmospheric pollution[200]. Fairly cold-tolerant, but branches can be damaged by temperatures below -10°C[200]. A fairly vigorous tree, it can grow up to 45cm in a year with up to 4cm increase in girth[185]. It has been planted for its timber in S. Europe, especially on alluvial soils[50]. Buds often begin to break in March, but trees do not come properly into leaf until June and growth in height rarely starts before June[185]. A very healthy species in Britain, rarely seen in anything but good health. It seems to be a very long-lived tree in this country with several specimens more than 250 years old[185]. Trees are thought to live for over 1,000 years in the wild[227]. Plants grow best in areas with warm summers[200]. They only produce fertile seeds after long hot summers[200]. The branches are brittle and subject to wind damage, but the tree usually recovers well[81]. Unlike most conifers, this species responds well to coppicing[81]. Special Features:North American native,



htut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprikliw hpa7tmwatli hjonli

drutta Chamaecyparis obtusa is an evergreen Tree growing to 40 m (131ft) by 25 m (82ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta None known

tcanta Agroforestry: Shade and shelter. A good pioneer species. General:Ornamental. Materials: Essential oils, Pesticide, Wood/timber. Wood Products: Sawn or hewn building timbers,Carpentry/joinery (exterior/interior), For light construction. Shingles, Wall panelling [1-7].

dwatta None Known

propta Seed - sow March/April in a seedbed outdoors[78]. The seed is best sown in pots in a frame[K]. Seed can take 18 months to germinate. One month warm then one month cold stratification has produced good results[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings in late summer or autumn in sandy soil in a cold frame[1, 11, 200]. Difficult, it may be best done in late winter to early spring[113].

nwatta Prefers full sun on moist, well-drained soil, in areas of moderate to high humidity, and preferably where the trees can be protected from harsh winds. It is fairly free of pests and diseases. There are many cultivars, some quite dwarf. Other cultivars have excellent foliage coloration or unusual growth habit. Cultivars include:'Aurea' -golden foliage; 'Caespitosa' - rare, miniature, about six inches tall;'Compacta' - dwarf, about three feet tall,dense, conical;'Coraliformis' - branchlets reddish and contorted; 'Crippsii' - broad pyramid with spreading branches and golden foliage; 'Erecta' - columnar habit;'Ericoides' - low, blue-gray foliage, 'Filicoides' -fern-like; 'Graclilis' - compact growth habit, tips of branchlets pendulous;'Kosteri' - dwarf, three to four feet tall, branch tips curved;'Mariesii' - dwarf, foliage variegated with yellowish white; 'Nana' - very dwarf, height and spread of two feet;'Pygmaea' - dwarf, two feet tall, wider than tall; 'Stoneham' - slow, dwarf, tiered branching; 'Tetragona' - slow, dwarf, erect.

## 5.2.847 Chamaecyparis pisifera

Sawara cypress

4 tin 8 cyuc 0 kcak 3 tcan 0 dwat 40 m hkuc hmimhtut cyutli hgtaccup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Chamaecyparis pisifera is an evergreen Tree growing to 40 m (131ft) by 25 m (82ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It cannot tolerate atmospheric pollution.

kcakta None known

tcanta Agroforestry: Boundary, barrier or support. Pioneer. General: Ornamental tree. Limited as a source of timber, but widely cultivated as an ornamental, with many named cultivars. As of other members of the genus, the wood is valued in Japan for traditional construction work, but its relative scarcity and the often poor shape of layering trees limit its commercial use [1-7]. Wood Products: Containers including boxes, cases and cooerage. Furniture. Sawn or hewn building timbers. Beams For heavy and light construction. Shingles. Veneers. Musical instruments [1-7]. Good pioneer species with durable wood. Species and large growing cultivars for lawn specimen, shrub borders and screen. Dwarf cultivars for rock gardens, foundation plantings or specimen.

dwatta None Known

propta Seed - sow March/April in a seedbed outdoors[78]. The seed is best sown in pots in a frame[K]. Seed

can take 18 months to germinate. One month warm then one month cold stratification has produced good results[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings in late summer or autumn in sandy soil in a cold frame[1, 11, 200]. Difficult, it may be best done in late winter to early spring[113].

nwatta Average, medium moisture, well-drained soils in full sun to part shade. Best in part shade. Prefers moist, fertile soils. Avoid wet, poorly-drained soils. Shelter from strong winds. Pruning is rarely needed. Winter Interest. Tolerates drought. Good pioneer species with durable wood. A number of varieties exist including: Chamaecyparis pisifera form. crassa Hayashi. Chamaecyparis pisifera form. intermedia Hornib. Chamaecyparis pisifera var. filifera Beiss. et Hochst. Chamaecyparis Chamaecyparis pisifera var. plumosa form. argenta Beiss. Chamaecyparis pisifera var. plumosa form. aurea Beiss. Chamaecyparis pisifera var. squarrosa form. leptoc Sieb. A large number of more compact cultivars including some dwarfs are available.

## 5.2.848 Populus x canadensis

Canadian Poplar, Carolina Poplar

4 tin 9 cyuc 0 kcak 3 tcan 1 dwat 40 m hkuc

htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Populus x canadensis is a deciduous Tree growing to 40 m (131ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Rooting hormone Shelterbelt WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. A fast-growing and wind resistant tree, it can be used in a shelterbelt planting[11, 200]. In more exposed sites there is some wind-pruning[11]. The tree is late coming into leaf and so often escapes the spring storms[11]. Wood - soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11]. Wood - soft, moderately strong, easily worked, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion[11]. Used in making the staves of barrels and woodenware, it turns well. It makes an excellent fuel[99].

dwatta Anodyne Antiinflammatory FebrifugeAlthough no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. This species is a hybrid and will not come true from seed. Cuttings of mature wood of the current season's growth, 20 - 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

troubled by browsing deer[233]. Although looking more like a moss, this genus is closely related to the ferns[200].

## 5.2.789 Pulsatilla cernua

4 tin 8 cyuc 1 kcak 0 tcan 2 dwat 0.2 m hkuc

htut cyutli tcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Pulsatilla cernua is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young leaves and roots - cooked with other foods[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Analgesic Antiinflammatory Antispasmodic Astringent Cardiotonic Dysentery Haemostatic Hypnotic SedativeHaemostatic[174]. The root is anodyne, anti-inflammatory, antispasmodic, astringent and sedative[174, 176, 218]. The root is an effective cure for bacterial and amoebic dysentery[176, 218]. It is also used in the treatment of nose bleeds and haemorrhoids and is used externally to treat Trichomonas vaginitis[176]. The fresh herb is a cardiac and venous sedative, producing a hypnotic state with a diminution of the senses followed by a paralysing action[218]. A constituent similar to digitalis can be extracted from the whole herb with the roots removed[176]. This is cardiotonic[176].

propta Seed - best sown as soon as it is ripe in early summer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame.

nwatta Requires a well-drained humus-rich gritty soil and a sunny position[200]. Tolerant of alkaline soils[200]. This species is closely related to P dahurica[200]. Large plants have a deep woody rootstock and transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.790 Campanula parryi

Parry's Bellflower, Idaho bellflower

4 tin 8 cyuc 1 kcak 0 tcan 1 dwat 0.3 m hkuc

hmimhtut cyutli tcup hwicli hrasljut hpa7tli prikliw hpa7tmwatli fyifxre7t hjonli

drutta Campanula parryi is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Leaves - raw or cooked.

tcanta Miscellany MiscellanyThe chewed blossoms are depilatory[155].

dwatta Antiphlogistic Miscellany Miscellany Poultice SkinThe root is antiphlogistic[155]. A poultice made from the chewed root has been applied to bruises[257]. The plant has been taken by pregnant women who desired a female child[257]. The dried plant has been used as a dusting powder to treat sores[257]. The chewed blossoms have been applied to the skin as a depilatory[257].

propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C[138]. When

they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[111]. Difficult, because the long runners do not take kindly to separation from the parent plant and are difficult to establish[221].

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Plants grow and spread freely in any light soil and do well when hanging over a wall[221]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Seed is freely produced in British gardens[221]. Plants are very attractive to slugs[221]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.791 Disporum sessile

Japanese Fairy Bells

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.6 m hkuc

hmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Disporum sessile is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[175]. Use a lime-free compost and keep it moist[175]. Stored seed requires 6 weeks cold stratification and should be sown as early in the year as possible[175]. Germination usually takes place within 3 - 6 months or more at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200].

nwatta Landscape Uses:Border, Woodland garden. Best grown in partial shade in a moist peaty or woodland soil[1, 175]. Plants spread rapidly[188] by means of creeping rhizomes when they are grown in a leafy soil[187]. This species is very closely related to Disporum nantouense, and both species could be identical[266]. Special Features:Attractive foliage.

## 5.2.792 Epigaea asiatica

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.1 m hkuc

pcimhmim cyutli tcup hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Epigaea asiatica is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[58, 105, 177]. No more details are given. The fruit is about 10mm in diameter[200].

tcanta A ground cover plant for a shady position[188], forming a carpet of growth[208]. Plants should be spaced about 25cm apart each way[208]. This species is probably

not very worthwhile for ground cover in Britain because of its difficulty to cultivate[208].

dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[200]. Another report says that the seed requires no pre-treatment and can be sown in late winter in a cold frame[113]. Surface sow and place the pot in light shade, do not allow it to dry out[113]. The seed usually germinates in 3 - 5 weeks[113]. As soon as they are large enough to handle, pot up the seedlings into individual pots. Be very careful since they strongly resent root disturbance. Grow them on in light shade in the greenhouse and plant them out in their permanent positions in the late spring of their second years growth. Cuttings of half-ripe wood, July/August in a frame[200].Take the cutting with a part of the previous year's growth[113]. (This report is unclear as to whether it means a heel of older wood or just a small section of older wood[K]) Plants self-layer and can be divided in the spring but this must be done with great care since they deeply resent root disturbance[200].

nwatta Requires an open lime-free humus-rich soil and shade from direct sunlight[1, 200], succeeding also in deep shade[182]. Grows well in the shade of rhododendrons and other calcifuge shrubs[245]. A difficult plant to grow in cultivation[200], though it is easier than *E. repens*[182]. The flower buds require a period of chilling to about 2°c before they will open[200]. The flowers are sweetly scented[245]. They are produced in terminal racemes on the previous year's shoots[275].

## 5.2.793 Dicentra canadensis

Squirrel Corn

4 tlin 8 cyuc 1 kcak 0 tcan 2 dwat 0.2 m hkuc pcmhmmt cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Dicentra canadensis is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root. No further details are given.

tcanta None known

dwatta Alterative Diuretic Tonic VDThe dried tubers are alternative, diuretic and tonic[4, 46, 61]. The tubers are useful in the treatment of chronic cutaneous affections, syphilis, scrofula and some menstrual complaints[4, 213].

propta Seed - best sown as soon as it is ripe in a cold frame[134]. Stored seed should be sown in early spring[175]. Germination usually takes place within 1 - 6 months at 15°c[175]. Two weeks warm stratification at 18°c followed by six weeks at 2°c can shorten up the germination time[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings 7 - 10cm long in sandy soil in a cold frame[200].

nwatta Easily grown in a rich light soil[1], preferably neutral to slightly acid[200]. Prefers light shade and a sheltered position according to one report[175] whilst another says that it prefers heavier shade[200]. Grows well in a sheltered corner of the rock garden. The seed is very difficult to harvest, it ripens and falls from the plant very quickly[134]. This species is closely related to *D. cucullaria*[270]. After fruit set, the bulblets of *Dicentra canadensis* remain dormant until autumn, when stored starch is converted to sugar. At this time also, flower buds and leaf primordia are produced below ground; these then remain dormant until spring[270]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.794 Fumaria officinalis

Fumitory, Drug fumitory

4 tlin 8 cyuc 1 kcak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyfxfre7t hjonli

drutta Fumaria officinalis is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: Curdling agentThe fresh or dried herb can be added to sour plant milks. A few sprays are added to each litre of liquid and left until the liquid has soured thickly. The sprays are then removed. It gives a tangy taste to the milk, acts as a preservative and prevents the rancid taste that can accompany soured milk[183].

tcanta Baby care DyeA yellow dye is obtained from the flowers[4, 21]. A decoction makes a curative lotion for 'milk-crust' on the scalps of babies[4].

dwatta Antirheumatic Antispasmodic Aperient Cholagogue Diaphoretic Diuretic Eczema Laxative TonicFumitory has been highly valued since at least Roman times for its tonic and blood cleansing effect upon the body[244]. It is particularly valuable in the treatment of all visceral obstructions, particularly those of the liver, in scorbutic affections and in troublesome eruptive diseases of the skin, especially eczema (for which it can be taken internally and externally)[4, 9, 238]. The herb is antispasmodic, aperient, cholagogue, slightly diaphoretic, mildly diuretic, laxative and weakly tonic[4, 9, 21, 165, 240]. The plant is harvested as flowering begins in the summer and can be used fresh or can be dried for later use[9, 238]. Some caution should be exercised in the use of this herb since excess doses cause hypnotic and sedative effects, especially if it is taken for more than about 8 days[238, 244].

propta Seed - sow spring in situ. There is normally very little need to sow this seed, the plant normally self-sows freely and should manage quite nicely by itself.

nwatta Prefers a light well-drained soil in a sunny position[9, 17, 238]. This plant can be a common weed in some gardens, self-sowing freely, though it is fairly easy to control by hand weeding[K]. The flowers are seldom visited by insects, but they are self-fertile and usually set every seed[4].

## 5.2.795 Anthemis cotula

Mayweed, Stinking chamomile

4 tlin 8 cyuc 1 kcak 1 tcan 2 dwat 0.6 m hkuc htut cyutli kyucutcp hwicli jlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyfxfre7t hjonli

drutta Anthemis cotula is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaThe herb is used as a flavouring in Peru[183]. It is aromatic. Caution is advised, there are some reports of toxicity. A herb tea is made from the flowers in a similar way to camomile tea[183] and it has a similar though weaker effect medicinally[4]. The odour is not very pleasant and so it is not commonly used[4].

tcanta Dye RepellentThe growing and the dried plant is said to repel mice and fleas[4, 20], it can also be used as an insecticide[21, 61, 100]. A gold dye is obtained from the whole plant[168, 169].

dwatta Antispasmodic Astringent Diaphoretic Diuretic Emetic Emmenagogue Epilepsy Stings TonicMayweed is closely related to camomile, but is far less effective as a medicine[254]. It has been used as an antispasmodic and to induce menstruation and was traditionally used to treat sup-posedly hysterical conditions related to the uterus[254]. It

A poultice of the root is used in the treatment of rheumatism[222]. A decoction of the root has been massaged into rheumatic joints[257]. The powdered root has been inhaled and then coughed up in order to restore the voice[257].

propta Spores - best sown as soon as they are ripe, though they can also be sown in the spring. Sow them on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division. This is best done in the spring[188].

nwatta Landscape Uses:Border. Container. Erosion control, Foundation, Ground cover, Massing, Rock garden, Woodland garden. Prefers a sandy humus-rich soil in a shady position that is moist even in winter[1]. Tolerates part sun for up to 6 hours a day if the soil remains moist[200]. Prefers a pH in the range 6.5 to 7.5[200]. A very ornamental plant, it is hardy in all parts of Britain but is best grown in a greenhouse[1]. Members of this genus are rarely if ever troubled by browsing deer[233]. Remove old fronds from the plant in the spring because they may harbour fungal diseases[200]. Special Features:Attractive foliage, North American native, Attracts butterflies, There are no flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.844 Lysimachia nummularia

Creeping Jenny, Moneywort, Creeping Charlie
4 tlin 8 cyuc 1 kcak 0 tcan 2 dwat 0.2 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyfxfre7t hjonli

drutta Lysimachia nummularia is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the leaves and flowers[46, 61, 177, 183].

tcanta Can be used as a ground cover plant in moist soils but requires weeding for the first year or so. Plants should be spaced about 60cm apart each way and form a carpet, rooting as they spread[208].

dwatta Antidiarrhoeal Antiscorbutic Astringent Diuretic VulneryThe whole herb, used fresh or dried, is antiscorbutic, mildly astringent, diuretic and vulnerary[4, 9, 46]. For drying, the herb is harvested in June[4]. Creeping Jenny is a very good wound-herb, the fresh leaves being bruised and applied externally to the affected area[4]. An infusion is used to treat internal bleeding and diarrhoea[9].

propta Seed - sow spring or autumn in a cold frame[200]. This species rarely produces seed in Britain[17]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot

up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Ground cover, Rock garden, Woodland garden. An easily grown plant, succeeding in a moist loamy soil[1]. Grows well in heavy clay soils. Grows well in marshy soil and in shallow water in pond margins[24, 56]. Prefers a shady position[111] but also succeeds in full sun[188]. Plants are hardy to at least -25°c[187]. Most species in this genus seem to be immune to the pre-dations of rabbits[233]. A very ornamental plant[1]. Special Features:Attractive foliage, Invasive, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms.

## 5.2.845 Linaria vulgaris

Yellow Toadflax, Butter and eggs

4 tlin 8 cyuc 1 kcak 3 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli hkaqyuctcp hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta Linaria vulgaris is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[7]. Use with caution, see the notes above on toxicity.

tcanta Dye InsecticideA yellow dye is obtained from the whole plant[7, 13]. It is obtained from the flowers according to other reports[4, 100]. A tea made from the plant has been used as an insecticide[222]. A good bee plant[24]. Dynamic accumulator.

dwatta Antiphlogistic Astringent Cathartic Detergent Diuretic Hepatic Homeopathy Ophthalmic PurgativeYellow toadflax has a long history of herbal use. It acts mainly on the liver and was once widely employed as a diuretic in the treatment of oedema[238]. It is little used now, but undoubtedly merits investigation[238]. The whole plant is antiphlogistic, astringent, cathartic, detergent, depurative, diuretic, hepatic, ophthalmic and purgative[4, 7, 9, 21]. It is gathered when just coming into flower and can be used fresh or dried[4, 238]. The plant is especially valued for its strongly laxative and diuretic activities[4]. It is employed internally in the treatment of oedema, jaundice, liver diseases, gall bladder complaints and skin problems[4, 222, 238]. Externally it is applied to haemorrhoids, skin eruptions, sores and malignant ulcers[238]. The plant should be used with caution. It should preferably only be prescribed by a qualified practitioner and should not be given to pregnant women[238]. Dosage is critical, the plant might be slightly toxic[21, 238]. The fresh plant, or an ointment made from the flowers, is applied to piles, skin eruptions etc[4, 222]. The juice of the plant, or the distilled water, is a good remedy for inflamed eyes and cleaning ulcerous sores[4]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of diarrhoea and cystitis[9].

propta Seed - sow early spring in situ. Division in April or the autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. This species can be divided successfully at almost any time in the growing season.

nwatta Succeeds in a moderately good well-drained soil[1]. Grows best in a neutral to alkaline soil[238]. It prefers a sunny position[111] but also succeeds in semi-shade[219]. A very drought resistant plant once established[200], it can be grown in a drystone wall[219]. Plants can spread fairly aggressively at the roots when they are in a suitable position[K]. They also often self-sow freely[238].

## 5.2.846 Chamaecyparis obtusa

Japanese cypress

4 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 40 m hkuc

dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°c for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°c will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species requires a moist well-drained neutral to acid soil[200, 238]. Another report says that it is happy in any reasonable soil[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. A very ornamental plant[1]. Plants are intolerant of root disturbance[200].

## 5.2.841 Polygonum lapathifolium

Curlytop Knotweed

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutili tucphja7n hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Polygonum lapathifolium is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked[105, 177]. Seed - raw or cooked. It is rather small and fiddly to utilize.

tcanta SoapThe plant produces a soft white mass, a froth like that of soap. It is used for bathing and washing clothes[272].

dwatta Antiseptic Astringent Febrifuge StomachicThe whole plant is antiseptic and astringent[178]. An infusion has been used in the treatment of stomach complaints and fevers[257]. The plant produces a soft white mass, a froth like that of soap. It is applied externally to burns[272].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment[1]. Plants seem to be immune to the predations of rabbits[233].

### 5.2.842 Sedum aizoon

Sedum

4 tin 10 cyuc 1 kcaak 0 tcan 1 dwat 0.4 m hkuc htut cyutili hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli fyixre7t hjonli

drutta Sedum aizoon is an evergreen Perennial growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young stems - raw or cooked[105, 177]. There is a definite bitterness in the flavour, few people would want to eat them as a regular part of their diet[K].

tcanta None known

dwatta The plant is used medicinally[266]. No further information is given.

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden. A very easily grown plant, it succeeds in most soils[188], tolerating those on the poor side[233], though it prefers a fertile well-drained soil[200]. Established plants are drought tolerant[200] although it prefers a soil that stays moist in the summer[187]. Requires a sunny position[188]. Hardy to -15°c according to one report[200] whilst another says that it is hardy to about -25°c[187]. A polymorphic species[1]. Butterflies are attracted to the flowers of this plant[233]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features:Attractive foliage, Not North American native, Naturalizing, Attracts butterflies, Attractive flowers or blooms.

## 5.2.843 Polystichum acrostichoides

Christmas Fern

4 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc pcmhmmim cyutili tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Polystichum acrostichoides is an evergreen Fern growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young fronds[159, 257]. No more details are given, but they are probably harvested as they unfurl and eaten cooked.

tcanta None known

dwatta Antiaphonic Emetic PoulitceChristmas fern was employed medicinally by several native North American Indian tribes, who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. A tea made from the root is blood purifier, emetic and febrifuge[222, 257]. It is used in the treatment of chills, fevers, pneumonia, stomach or bowel complaints and rheumatism[222, 257].

is rarely used in contemporary herbal medicine[254]. The whole plant is antispasmodic, astringent, diaphoretic, diuretic, emetic, emmenagogue and tonic[4, 61]. It is used internally as a tea, which can be made either from the flowers or the whole plant, though the flowers are less unpleasant and so are more commonly used[4]. An infusion is used in the treatment of a variety of complaints such as rheumatism, epilepsy, asthma, colds and fevers[257]. Applied externally, it is used as a poultice on piles or to draw splinters out of the body, and can also be applied to the bath water[4, 257]. The leaves are rubbed onto insect stings[222]. Some people are allergic to the plant and this remedy could give them painful blisters[240]. This herb is contraindicated for pregnant women or nursing mothers[254].

propta Seed - best sown outdoors as soon as it is ripe. Most of the seed germinates in the autumn.

nwatta Prefers a sunny position and a well-drained soil that is neutral to slightly acid[1, 200]. Succeeds in heavy clay soils. Bees dislike this plant[4]. The leaves contain glands which release a most disagreeable odour when the plant is handled and can cause allergic reactions in people.

### 5.2.796 Scabiosa fischeri

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutili kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwisslip hpa7tmwatli xre7t hjonli

drutta Scabiosa fischeri is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. The seedlings are subject to damping off[1] so water with care and make sure to give adequate ventilation. Prick out the seedlings into individual pots once they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Prefers a neutral or alkaline soil and a sunny position[200]. Succeeds in ordinary garden soil[1]. A very ornamental plant[1]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.797 Tulipa gesneriana

Tulip, Didier's tulip

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc htut cyutili tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Tulipa gesneriana is a BULB growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[22, 61]. It can be dried and ground into a powder and then mixed with cereals when making bread etc[46, 105]. Some caution is advised, see the notes above on toxicity.

tcanta PollutionPlants have been grown indoors in pots in order to help remove toxins from the atmosphere. It has been shown to help remove formaldehyde, xylene and ammonia[259].

dwatta None known

propta Seed - best sown in a shady part of the cold frame as soon as it is ripe in early summer[1], or in the early autumn[200]. A spring sowing of stored seed in the greenhouse also succeeds[K]. Sow the seed thinly so that the seedlings can be grown on without disturbance for their first growing season - apply liquid feeds to the pot if necessary. Divide the bulbs once the plants have become dormant, putting 3 - 4 bulbs in each pot. Grow the on in the greenhouse for at least the next year, planting them out when dormant. Division of offsets in July. Larger bulbs can be planted out straight into their permanent positions, or can be stored in a cool place and then be planted out in late autumn. It is best to pot up smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late summer to the middle of autumn.

nwatta Easily grown in a sunny position in a well-drained sandy soil with added leafmould[1]. The bulbs are very hardy, surviving soil temperatures down to about -12°c[214]. This is a complicated species, or perhaps a group of very closely related species, some members of which are probably native to Europe[50]. It is a parent of the cultivated garden tulips[50]. The flowers are sweetly scented[245]. Bulbs can be harvested in June after they have died down and then stored in a cool dry place, being planted out again in October[1].

## 5.2.798 Arabis lyrata

Rock Cross, Kamchatka rockcross, Lyrate rockcross

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutili kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Arabis lyrata is a BIENNIAL/PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[177]. Rosettes of the lobed leaves are added to tossed salads or served as a green vegetable[257].

tcanta None known

dwatta None known

propta Seed - it is best to surface sow the seed as soon as it is ripe in a light position in a cold frame[134]. Seed can also be sown in spring. It usually germinates in 2 - 3 weeks at 21°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering[111]. Very easy, the divisions can be planted out straight into their permanent positions if required. Cuttings in a shady border in summer[11].

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. This species of rockcross is considered an important first brood nectar plant for "Kärner Blue" butterfly (Lycaeides melissa samuelis Nabokov), an endangered species in North America. The following notes are based on the general needs of the genus. Easily grown in ordinary well-drained soil[1].

## 5.2.799 Heuchera diversifolia

Alum Root, Crevice aluroot

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutili tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Heuchera diversifolia is an evergreen Perennial growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked. Not very palatable[172].

tcanta MordantThe root can be used as an alum substitute, this is a mordant used in fixing dyes[168, 172]. The root is rich in tannin, is this the active ingredient that acts as a mordant?[172]. A good ground cover plant for the woodland garden[200]. Plants should be spaced about 30cm apart each way[208].

dwatta Antiphlogistic Antiseptic Astringent Febrifuge OphthalmicThe root is antiphlogistic, antiseptic, astringent, febrifuge and ophthalmic[94, 172].

propta Seed - sow early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. Division in March or October[1, 111]. It is best to divide the plants in August or early September, making sure that the woody roots are planted quite deeply with only the crown of foliage above the ground[233].

nwatta Succeeds in any good sweet garden soil that does not dry out in spring[1]. Prefers full sun but tolerates partial shade[1, 111]. Prefers a well-drained fairly rich and not too heavy soil[111]. Plants are hardy to about -15°c[187]. Apt to hybridize with other members of this genus[111]. This species is probably best treated as a sub-species of *H. micrantha*.

## 5.2.800 Mertensia ciliata

Mountain Bell, Tall fringed bluebells

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Mertensia ciliata is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Flowers - raw[172]. Leaves - raw or cooked[172]. The leaves are rather hairy and are not so nice when eaten raw[172].

tcanta None known

dwatta Antipruritic GalactagogueThe plant is galactagogue[257]. An infusion has been used to increase the milk flow of nursing mothers[257]. An infusion of the powdered root has been used to relieve the itching caused by smallpox and measles[257].

propta Seed - best sown in a cold frame as soon as it is ripe[1, 200]. Sow stored seed as early in the year as possible. Protect from direct sunlight[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division, with care, in early spring or autumn[200].

nwatta Easily grown in an ordinary garden soil with some shade[1, 111]. Requires a moist peaty soil in full sun or light shade[187]. Plants are hardy to about -20°c[187]. A very ornamental plant[1].

## 5.2.801 Hosta clausa

4 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hosta clausa is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil.

Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta This plant has a stoloniferous habit and makes an excellent dense ground cover[251].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. A spreading plant with stoloniferous roots, forming medium size clumps[200, 233]. A triploid species that is not often found in the wild, it does not flower very freely and indeed there are forms that do not flower at all[251]. The cultivar 'Normalis' flowers more freely and is very showy, but is less stoloniferous and therefore less suitable for ground cover[251]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. Hybridizes freely with other members of this genus[200].

## 5.2.802 Lycopus americanus

Water Horehound, American water horehound

4 tlin 8 cyuc 1 kcak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Lycopus americanus is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: RootEdible Uses: Root - raw or cooked[207]. This contradicts with the report in [200] that the plant does not form tubers on its rhizomes.

tcanta DyeThe juice gives a permanent colour to linen and wool and does not wash out[207]. The colour is not mentioned[K].

dwatta Astringent Narcotic SedativeThe whole plant is used as an astringent, hypoglycaemic, mild narcotic and mild sedative[4, 102, 222, 238]. It also slows and strengthens heart contractions[238]. The plant has been shown to be of value in the treatment of hyperthyroidism[222, 238], it is also used in the treatment of coughs, bleeding from the lungs and consumption, excessive menstruation etc[4, 238]. It should not be prescribed for pregnant women or patients with hypothyroidism[238]. The plant is harvested as flowering be-

hmim cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Astilbe chinensis is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: Young shoots[177]. No more details are given.

tcanta Landscape Uses: Border, Container, Massing, Rock garden, Woodland garden. There are some named varieties, selected for their ornamental value[233]. A first class ground cover plant, the lower-growing cultivar 'Pumila' is particularly recommended[233]. Special Features:Attractive foliage, Suitable for dried flowers. Dynamic accumulator.

dwatta None known

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse in early spring. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame until they are at least 20cm tall. Plant them out in the summer, or late in the following autumn. Division in spring. This is best done every 3 - 4 years in order to maintain the vigour of the plant[200]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Prefers a rich garden soil, but succeeds in most soils so long as they stay reliably moist in the summer[1, 233]. Requires a wet or moist peaty soil in sun or partial shade[187], growing well under shrubs[233]. Prefers a pH in the range 5.5 to 7[200]. Prefers partial shade[200], especially if the soil is on the dry side[233]. Plants are hardy to about -20°c[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. There are some named varieties, selected for their ornamental value[233].

### 5.2.839 Hosta plantaginæa

August Lily

4 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Hosta plantaginæa is a PERENNIAL growing to 0.6 m (2ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked[105, 177]. One report suggests the plant may be poisonous[178].

tcanta EssentialAn essential oil is obtained from the leaves, used in perfumery[178]. A useful ground cover plant, succeeding in dense shade, though rather slow spreading[197]. Plants should be spaced about 60cm apart each way[208].

dwatta CancerThe flowers are said to have anticancer activity[218].

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and

should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. This species tolerates quite a lot of sun[187]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. The plant forms open clumps[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. A very ornamental plant[1], there are some named varieties[187]. The flowers open in the evening[188] and have a delicious lily-like fragrance[233]. The plant only flowers well when grown in a warm position[233], and is not really satisfactory when grown in most areas north of London[251]. Hybridizes freely with other members of this genus[200].

### 5.2.840 Gentiana scabra

Long Dan Cao

4 tlin 8 cyuc 1 kcak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gentiana scabra is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young plant and old leaves - cooked[105]. A famine food, used when all else fails[177, 179].

tcanta None known

dwatta Anodyne Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Eczema Emmenagogue Expecto-rant Febrifuge Pectoral Refrigerant Stomachic Tonic UrinaryLong Dan Cao is used as a bitter tonic in Chinese herbalism where it promotes digestive secretions and treats a range of illnesses associated with the liver[254, 279]. The root is antibacterial and stomachic[176]. It is used in the treatment of anorexia, dyspepsia, jaundice, leucorrhoea, eczema, conjunctivitis, sore throat, acute infection of the urinary system, hypertension with dizziness and tinnitus[176, 279]. The root is harvested in the autumn and dried for later use. This species is one of several that are the source of the medicinal gentian root[4], the following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: TeaA pleasant tasting tea is made from the leaves and flower heads[161, 177, 183, 257].

tcanta None known

dwatta Analgesic FebrifugeThe leaves and stems are analgesic[257]. An infusion is used to relieve the pain of headaches and to treat stomach aches and fevers[257]. A decoction is used as a wash to relieve pain and to treat poison ivy rash[257]. The decoction is also used as a wash to draw the poison out of a rattlesnakes bite[257].

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in early spring. Only just cover the seed and put the pot in a sunny position. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. Division in spring is possible but very difficult because the plant has a long taproot[200].

nwatta Landscape Uses:Border. Prefers a sunny well-drained border of fairly rich soil[1]. Established plants are extremely drought tolerant[200]. A very ornamental plant[1]. Although perennial, plants are sometimes grown as annuals, they flower in their first year from seed[200]. Special Features:North American native, Naturalizing, Suitable for cut flowers.

## 5.2.836 Crocus kotschyanus

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.3 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Crocus kotschyanus is a CORM growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from February to June, in flower from September to November, and the seeds ripen from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Corm - cooked[124].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a light sandy soil in pots in a cold frame[1]. The seed can also be sown in a cold frame in early spring[1]. Sow thinly because the seed usually germinates freely[1], within 1 - 6 months at 18°c[164]. Unless the seed has been sown too thickly, do not transplant the seedlings in their first year of growth, but give them regular liquid feeds to make sure they do not become deficient. Divide the small bulbs once the plants have died down, planting 2 - 3 bulbs per 8cm pot. Grow them on for another 2 years in a greenhouse or frame and plant them out into their permanent positions when dormant in late summer[K]. Plants take 3 - 4 years to flower from seed[200]. Division of the clumps after the leaves die down in spring[1, 200]. The bulbs can be replanted direct into their permanent positions if required.

nwatta Prefers a sandy loam[1]. Plants are easily grown in a bulb frame or in a sunny position outdoors[90], succeeding in a well-drained moisture-retentive soil[200]. A very ornamental plant[1]. Plants tend to move considerably from their original planting place because of their means of vegetative reproduction, it is therefore wise not to grow different species in close proximity[1]. Any planting out is best done in late spring and early summer[245]. Protect the corms from mice[1]. The flowers are only open during the day time, closing at night[245].

## 5.2.837 Trillium grandiflorum

White Trillium, Large Flower Trillium, White Trillium, Large Flower Wakerobin, Large Flowered Tril  
4 tin 9 cyuc 1 kcak 0 tcan 2 dwat 0.4 m hkuc pcmhmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Trillium grandiflorum is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked and used like spinach[46, 61, 105, 183]. A famine food, it is only used when all else fails[177].

tcanta None known

dwatta Antispasmodic Diuretic Emmenagogue OphthalmicThe root is diuretic[257]. The raw root is grated and applied as a poultice to the eye in order to reduce swelling[207, 213]. The raw root s also used as a poultice on aching rheumatic joints[257]. A decoction of the root bark can be used as drops in treating a sore ear[257]. The grated root is steeped in water and drunk as a tea for the treatment of cramps[207]. The grated root is simmered in water and drunk for the treatment of irregular menses[207, 213].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°c. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Landscape Uses:Border, Ground cover, Woodland garden. Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil but succeeds in acid or limey soils[200]. Grows well in open woodland[1, 90]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42, 138]. A very ornamental and long-lived plant[1, 138, 233]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238]. A polymorphic species, it is very subject to mutation[90]. Some named varieties have been selected for their ornamental value[200]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Special Features: Attractive foliage, North American native, Naturalizing, Attracts butterflies. The plant is heat tolerant in zones 7 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.838 Astilbe chinensis

Pumila Spirea,Chinese Astilbe  
4 tin 8 cyuc 1 kcak 3 tcan 0 dwat 0.7 m hkuc

gins and can be use fresh or dried, in an infusion or as a tincture[4, 238].

propta Seed - sow spring or autumn in a cold frame[238]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring or autumn[238]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in damp meadows or in wet places by ponds or streams[200].

## 5.2.803 Trillium smallii

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.4 m hkuc pcmhmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Trillium smallii is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[58, 105, 177]. No more details are given.

tcanta None known

dwatta None known

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°c. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

## 5.2.804 Acinos alpinus

Alpine Calamint

4 tin 8 cyuc 1 kcak 0 tcan 1 dwat 0.5 m hkuc htut cyutli hgatkyyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Acinos alpinus is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: Condiment TeaThe leaves are used as a flavouring in cooked dishes[183] and also as a tea substitute[148].

tcanta None known

dwatta Diaphoretic FebrifugeDiaphoretic, febrifuge[148].

propta Seed - sow early spring in a cold frame. If you have sufficient seed then you could try sowing in situ in April or May. Germination should take place within a month. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Basal cuttings in late spring.

nwatta Succeeds in almost any well-drained soil, doing well in a hot dry soil[200].

## 5.2.805 Potentilla rupestris

Rock Cinquefoil

4 tin 8 cyuc 1 kcak 0 tcan 0 dwat 0.5 m hkuc hmihtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxc7t hjonli

drutta Potentilla rupestris is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea[2, 46, 61, 183].

tcanta None known

dwatta None known

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Succeeds in dry soils in the wild[187]. Hardy to about -25°c[187]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.806 Astilbe thunbergii

Astilbe

4 tin 9 cyuc 1 kcak 3 tcan 0 dwat 0.5 m hkuc hmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Astilbe thunbergii is a PERENNIAL growing to 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - cooked[177, 183]. The leaves are a tea substitute[183].

tcanta Landscape Uses: Border, Container, Massing, Woodland garden. Special Features: Attractive foliage. Dynamic accumulator.

dwatta None known

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse in early spring. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame until they are at least 20cm tall. Plant them out in the summer, or late in the following autumn. Division in spring. This is best done every 3 - 4 years in order to maintain the vigour of the plant[200]. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in a rich garden soil if this stays reliably moist in the summer[1]. Requires a wet or moist peaty soil in sun or partial shade[187]. Prefers a pH in the range 5.5 to 7[200]. Prefers partial shade[200]. The plant is found in sunny habitats in the wild[58]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 5.2.807 Dianthus plumarius

Pink Feathered pink, Cottage Pink
4 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc
htuc cyutli kyucocup hwicli hyihstrasjlutnyik hpa7tli prikriwis hpa7tmwatli xre7t hjonli

drutta Dianthus plumarius is an evergreen Perennial growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 3. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: FlowersEdible Uses: The petals are made into cordials, syrups, sauces, vinegars etc[183].

tcanta None known
dwatta None known

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings, taken at flowering time, with four pairs of leaves and trimmed just below a joint[200].

nwatta Landscape Uses:Alpine garden, Border, Container, Rock garden, Seashore, Specimen. Prefers a neutral to slightly alkaline soil in a sunny well-drained position[200]. Succeeds in dry soils and in poor soils[200]. Plants can be grown on walls[200]. There are many named forms, selected for their ornamental value[200]. The flowers are very fragrant[17], diffusing a powerful clove-like scent[245]. Individual plants become rather untidy after a few years and are best replaced every 2 - 4 years[200]. Some older cultivars, such as 'Sops in Wine' have a tendency to flower themselves to death. These should be grown in a richer soil in order to encourage the production of more foliage and should not be allowed to flower in their first year[200]. Special Features:Attractive foliage, Suitable for cut flowers, Fragrant flowers.

### 5.2.808 Paeonia officinalis

Peony, Common peony
4 tin 10 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyixre7t hjonli

drutta Paeonia officinalis is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Condiment-Flowers - cooked. They can be used as a vegetable[177] or to scent tea[183]. The hot seeds are ground into a powder and used as a spice in ale or in the food that accompanies it[183]. (Does this mean that the seed is heated before grinding, or that it has a hot flavour?[K])

tcanta None known

dwatta Anticonvulsant Antirheumatic Antispasmodic Diuretic Epilepsy Sedative TonicPeony root has been used medicinally for over 2,000 years and it gained a reputation as a treatment for epilepsy and to promote menstruation. This species was very popular up to the 16th century, but is little used in contemporary European herbalism, though it is sometimes employed where an antispasmodic and sedative are required[238, 254]. The root is antispasmodic, diuretic,

sedative and tonic[4, 7, 21]. The root is harvested in the autumn from plants that are at least two years old and is dried for later use[4]. It has been successfully employed in the treatment of convulsions and spasmodic nervous affections such as epilepsy[4, 7]. It has also been used in the treatment of whooping cough whilst suppositories are sometimes made of the root to relieve anal and intestinal spasms[254]. This remedy should be used with caution and not at all by pregnant women. Large doses can be toxic[7, 21, 254]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Landscape Uses:Border, Foundation, Seashore, Specimen. Requires a deep rich soil, preferably neutral or slightly alkaline[1, 233], doing quite well in sun or light shade[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Plants can be naturalised in grass so long as the soil is good[233]. Hardy to about -25˚c[187]. A very variable plant, there are at least 4 sub-species[250]. There are a number of named forms, selected for their ornamental value[187]. A long-lived plant, living for 50 years or more in gardens[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. This species can spread fairly freely by means of its tuberous rootstock[233]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Special Features:Not North American native, All or parts of this plant are poisonous, Suitable for cut flowers, Fragrant flowers.

### 5.2.809 Carex disticha

Two-rank sedge

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Carex disticha is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

tcanta BeddingThe leaves are used for bedding[61].

This species is easily grown in a sandy, lime-free soil enriched with organic matter, so long as this is deep enough to accommodate the plant's roots[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. Plants are intolerant of root disturbance[200].

### 5.2.833 Gentiana punctata

Spotted Gentian

4 tin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.6 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Gentiana punctata is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta The root is sometimes used in the manufacture of gentian bitters[183].

tcanta None known

dwatta Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Stomachic TonicThis species is one of several that are the source of the medicinal gentian root[4], the thick rootstock can be up to 1 metre long[239]. The following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10˚c for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5˚c will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures

are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species is not particular about soil type, so long as it is deep enough to accommodate the plant's roots[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. Plants are intolerant of root disturbance[200].

### 5.2.834 Heuchera cylindrica

Alum Root, Roundleaf alumroot, Alpine alumroot, Beautiful alumroot, Poker alumroot

4 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.5 m hkuc
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Heuchera cylindrica is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - cooked[172].

tcanta MordantThe root can be used as an alum substitute, this is a mordant that is used in fixing dyes[168, 257]. The root is rich in tannin and it has been suggested that this is the mordant[168, 172]. A good ground cover plant for the woodland garden[200]. Plants should be spaced about 30cm apart each way[208].

dwatta The whole plant, but especially the roots, is as-tringen[257]. A decoction of the roots is used in the treatment of diarrhoea and stomach cramps[257]. Externally, a decoction is used as a wash on aching joints[257]. A poultice of the mashed peeled roots is used in treating rashes, sores and cuts[257]. When mixed with the spores of puffballs, it has been used as a salve for treating nappy rash[257].

propta Seed - sow early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. Division in March or October[1, 111]. It is best to divide the plants in August or early September, making sure that the woody roots are planted quite deeply with only the crown of foliage above the ground[233].

nwatta Succeeds in any good sweet garden soil that does not dry out in spring[1]. Prefers full sun but tolerates partial shade[1, 111]. Prefers a well-drained fairly rich and not too heavy soil[111]. Plants are hardy to about -20˚c[187]. Closely related to *H. chlorantha*[200], it is apt to hybridize with other members of this genus[111]. A very ornamental plant[60], a number of named forms have been selected for their ornamental value[187]. The subspecies *H. cylindrica* glabella has been specifically mentioned for its use as a mordant[168, 172].

### 5.2.835 Ratibida columnifera

Prairie Coneflower, Upright prairie coneflower, Woolly Cinquefoil, Praire Coneflower, Mexican Hat

4 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc
htut cyutli hgatkyucocup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Ratibida columnifera is a PERENNIAL growing to 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers



for a number of disorders. In particular, it is a valuable astringent remedy treating wounds and bleeding, whilst it is particularly useful in the treatment of urinary tract disorders, being used both for serious ailments such as nephritis and for more common problems such as cystitis[254]. The plant contains saponins that are antifungal and act specifically against the *Candida* fungus which is the cause of vaginal and oral thrush[238, 254]. It also contains rutin which is used to treat capillary fragility, and phenolic glycosides which are anti-inflammatory[238]. The leaves and flowering tops are anthelmintic, anti-inflammatory, antiseptic, aromatic, astringent, carminative, diaphoretic, mildly diuretic, febrifuge and stimulant[4, 7, 9, 21, 147, 165]. A good vulnerary herb, it has also proved of value when used internally in the treatment of urinary infections, chronic catarrh, skin diseases, influenza, whooping cough, bladder and kidney stones etc[4, 238]. Due to its mild action, goldenrod is used to treat gastro-enteritis in children[254]. It makes an excellent mouthwash in the treatment of thrush[7]. The plant is gathered in the summer and dried for later use[7]. The seed is anticoagulant, astringent and carminative[218]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of kidney and bladder disorders, rheumatism and arthritis[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Solidago virgaurea* for infection of the urinary tract, kidney and bladder stones (see [302] for critics of commission E).

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta An easily grown plant, it succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. The bruised plant smells like wild carrots[4]. The sub-species *S. virgaurea* minuta is only 10cm tall and wide[188]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238].

### 5.2.831 *Scutellaria indica*

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuu  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Scutellaria indica* is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young plant - cooked[105, 177].

tcanta None known  
dwatta Used as a folk remedy for traumatic injuries[266].

propta Seed - sow in situ outdoors in late spring. If there is only a small quantity of seed it is better to sow it in a pot in a cold frame in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the spring. Division in spring just before new growth begins. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Basal cuttings in early summer in a frame. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in

light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in a sunny position in any ordinary garden soil that does not dry out during the growing season[200]. This species grows well in a rock garden[188].

### 5.2.832 *Gentiana purpurea*

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.6 m hkuu  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Gentiana purpurea* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta The root is sometimes used in the manufacture of gentian bitters[183].

tcanta None known  
dwatta Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Stomachic TonicThis species is one of several that are the source of the medicinal gentian root[4], the following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200].

dwatta None known

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.810 *Scutellaria baicalensis*

Baikal Skullcap - Huang-Qin

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.3 m hkuu  
hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Scutellaria baicalensis* is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - cooked as a vegetable[105, 177, 183]. The whole plant is dried and used as a tea substitute[105, 183].

tcanta None known

dwatta Anodyne Antibacterial Anticholesterolemic Antipyretic Antispasmodic Astringent Cancer Cholagogue Diuretic Dysentery Expectorant Febrifuge Haemostatic Laxative Nervine Sedative Stomachic TB Tonic UrinaryBaikal skullcap is commonly used in the Chinese herbalism, where it is considered to be one of the 50 fundamental herbs and is used primarily in treating "hot and damp" conditions such as dysentery and diarrhoea[218, 254]. It has been used medicinally for over 2,000 years and recent research has found that the roots contain flavonoids that greatly enhance liver function and also have anti-inflammatory and anti-atherogenic effects[238]. The root is anodyne, antibacterial, anticholesterolemic, antipyretic, antispasmodic, astringent, cholagogue, diuretic, expectorant, febrifuge, haemostatic, laxative, nervine, mildly sedative, stomachic and tonic (for TB)[46, 61, 147, 174, 176, 218, 238]. It reputedly calms the foetus in pregnant women[238]. The root is used internally in the treatment of enteritis, dysentery, diarrhoea, jaundice, chronic hepatitis, urinary tract infections, hypertension, threatened miscarriage, nosebleed and haemorrhage from the lungs or bowel[238]. It is one of the ingredients of the Chinese drug 'injection of three yellow herbs'[238]. The root is harvested in the autumn or spring from plants 3 - 4 years old and is dried for later use[238]. The seed is used to cleanse the bowels of blood and pus[218]. For the treatment of prostate cancer [301].

propta Seed - sow outdoors in situ in late spring[200] If there is only a small quantity of seed it is better to sow it in a pot in a cold frame in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring just before new growth begins. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in a sunny position in any ordinary garden soil that does not dry out during the growing season[200]. Prefers a light well-drained soil in sun or partial shade[238]. This species requires sharp drainage and, once established, is drought tolerant[238]. Plants are hardy to at least -15°C[238]. A very ornamental plant[1].

### 5.2.811 *Iris sibirica*

Siberian Iris

4 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuu  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfkrx7t hjonli

drutta *Iris sibirica* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: RootEdible Uses: Root - an edible starch is said to be extracted from it[2, 105, 177]. The root is not eaten in China[178]. Some caution is advised since there are reports that the plant might be poisonous. Perhaps the extracted starch is edible.

tcanta InsecticideAn insecticide is obtained from the plant[178]. (from the root?)

dwatta ExpectorantExpectorant[178].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done in August/September after flowering but can also be done in April. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Specimen, Woodland garden. Prefers a humus-rich soil[79], succeeding in a moist border or by water[42, 79]. Grows well in heavy clay soils. The plants are very cold tolerant, but they can be damaged when dormant if the soil is too moist[79]. A very ornamental plant, there are many named varieties[187]. Plant the roots out very shallowly[79]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands plant, Suitable for cut flowers.

### 5.2.812 *Lobelia sessilifolia*

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.7 m hkuu  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lobelia sessilifolia* is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: LeavesEdible Uses: The buds and young plants are cooked and used as a famine food[177, 179]. Caution is advised because they contain a toxic alkaloid[179].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200]. Basal cuttings in spring[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Layering in moist sand, it forms roots at the nodes[200].

nwatta Requires a wet soil[1].

### 5.2.813 Pimpinella saxifraga

Greater Burnet Saxifrage, Hollowstem burnet saxifrage  
4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis  
hpa7tmwatli fyfxre7t hjonli

drutta Pimpinella saxifraga is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: ConditionAn essential oil from the roots is used as a flavouring in candy, liqueurs etc[183].

tcanta None known

dwatta Antispasmodic Astringent Carminative Cholagogue Diaphoretic Diuretic Emmenagogue Ophthalmic Resolvent Skin Stomachic UrinaryThe leaves are diaphoretic, diuretic, resolvent and stomachic[4]. The plant is harvested as it comes into flower and dried for later use[4]. The root is anti-inflammatory, mildly astringent and expectorant[9]. The fresh root is very hot and acrid, but this pungency is greatly reduced when the root is dried[4]. When chewed, the fresh root is effective in treating toothaches and paralysis of the tongue[4]. An effective diuretic, the root is used in treating disorders arising from obstructions of the viscera[4]. The root is also used for soothing coughs or the effects of laryngitis and bronchitis[9]. The roots can be harvested in the spring or autumn and are dried for later use[9]. The seeds are carminative[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Pimpinella major Greater Burnet Saxifrage for cough/bronchitis (see [302] for critics of commission E).

propta The seed requires a period of cold stratification. If you can obtain fresh seed then it is best sown immediately. This can be done in situ if you have sufficient seed, but if you only have a small quantity then it is safer to sow it in pots in a cold frame. Sow stored seed as soon as you can obtain it, this is probably best done in a cold frame. When they are large enough to handle, prick the pot-grown seedlings out into individual pots and plant them out in the summer.

nwatta Easily grown in any good soil[1], preferring rather moist conditions[187]. Grows best in a cool position[233]. Plants are hardy to about -20°c[187].

### 5.2.814 Solidago spathulata

Coast Goldenrod, Creeping Goldenrod  
4 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis  
hpa7tmwatli xre7t hjonli

drutta Solidago spathulata is a PERENNIAL growing to 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: TeaLeaves and flowering stems - cooked[172]. Seed - used as a thickener in soups etc[172]. The seed is very small and fiddly to harvest[K]. A tea is made from the leaves and flowers[172].

tcanta Mustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta Antiseptic Haemostatic SalveThe flowering stems are antiseptic, haemostatic and salve[168, 172]. An infusion of the dried powdered herb can be used as an antiseptic[168]. A poultice of the toasted, powdered leaves has been mixed with oil and used in the treatment of mumps[257].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large

enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border, Ground cover, Specimen, Woodland garden. Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. Judging by the plants native habitat, it is likely to be tolerant of maritime exposure[K]. This species is not hardy in the colder areas of Britain, it tolerates temperatures down to between -5 and -10°c[200]. A rather greedy plant, it is apt to impoverish the soil[1]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238]. Special Features:Attractive foliage, North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above.

### 5.2.815 Ruta graveolens

Rue, Common rue, Herb of Grace, Garden Rue  
4 tlin 10 cyuc 1 kcaak 0 tcan 3 dwat 0.5 m hkuc  
hmimhtut cyutli hqatkyuctup hwicli hyishrasjlutnyik hpa7tli  
flatprikkwis hpa7tmwatli xre7t hjonli

drutta Ruta graveolens is an evergreen Shrub growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Condition Rutin TeaLeaves - raw or used as a seasoning[2, 7, 19, 21, 27, 89]. It is occasionally eaten in salads[4], but is strongly aromatic and slightly toxic, so should only be used in small quantities[7, 19, 148, 183]. The taste is strong and bitter[238]. The leaves contain rutin, which has a beneficial effect upon the circulatory system[218]. Some caution is advised, see notes on toxicity above. The leaves can be brewed into a tea[183].

tcanta Dye Essential Repellent StrewingThe growing or the dried plant can be used to repel insects, it is most useful when the plant is grown near roses and raspberries[4, 14, 18, 20, 148]. The dried herb can also be put in the linen cupboard to repel moths[14, 18]. The growing plant is also said to repel cats[20]. A red dye is obtained from the plant[148]. An essential oil is obtained from the leaves and young shoots, it is used in perfumery and as a food flavouring[61]. The plant was formerly used as a strewing herb[148]. Plants can be grown for ground cover when planted about 45cm apart each way[208]. They can be trimmed back in spring to keep them bushy[208].

dwatta Abortifacient Anthelmintic Antidiarrhoeal Antidote Antiinflammatory Antispasmodic Carminative Emetic Emmenagogue Expectorant Haemostatic Homeopathy Ophthalmic Rubefacient Stimulant StomachicRue has a long history of use as a domestic remedy, being especially valued for its strengthening action on the eyes[4]. The plant contains flavonoids (notably rutin) that reduce capillary fragility, which might explain the plants reputation as an eye strengthener[238]. Some caution is advised in its use internally, however, since in large doses it is toxic and it can also cause miscarriages[4, 7, 238]. The whole herb is abortifacient, anthelmintic, antidote, antispasmodic, carminative, emetic, emmenagogue, expectorant, haemostatic, ophthalmic, rubefacient, strongly stimulant, mildly stomachic and uterotoxic[4, 7, 21, 165, 218]. The tops of fresh shoots are the most active medicinally, they should be gathered before the plant flowers and can be used fresh or dried[4]. An infusion is used in the treatment of hysterical affections,

drutta Hosta rectifolia is a PERENNIAL growing to 0.6 m (2ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked[105]. Not very tasty[116].

tcanta A useful ground cover plant, succeeding in dense shade, though rather slow spreading[197]. Plants should be spaced about 45cm apart each way[208].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. A robust plant, forming medium-size to large clumps, the rhizome is slightly stoloniferous[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. Hybridizes freely with other members of this genus[200].

### 5.2.828 Stachys hyssopifolia ambigua

hyssopleaf hedgenettle  
4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis  
hpa7tmwatli xre7t hjonli

drutta Stachys hyssopifolia ambigua is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Eaten as a vegetable[178]. No more details are given, it is likely to be the roots or the leaves that are eaten[K].

tcanta DeodorantNone known

dwatta Astringent Carminative DeodorantThe plant is astringent, carminative and deodorant[178, 218].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in

late spring or early summer, after the last expected frosts. Division in spring.

nwatta Succeeds in any deep well-drained moderately fertile soil in full sun or light shade[200]. A good bee plant[200].

### 5.2.829 Narcissus jonquilla

Jonquil  
4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Narcissus jonquilla is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers - raw or candied and made into desserts[183].

tcanta EssentialAn essential oil obtained from the flowers is used in perfumery[61, 100, 171]. 1 kg of flowers yields 1g absolute of essential oil[46].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. A short stratification will improve the germination of stored seed. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first two years of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in the summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. Division of bulbs after the leaves die down in early summer[1]. Larger bulbs can be replanted immediately into their permanent positions, or can be stored in a cool place and then be planted out in the autumn. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in the autumn.

nwatta Prefers a deep rather stiff soil but succeeds in moist soils[1]. Grows well in heavy clay soils. Easily grown in a dry sunny position[90]. Prefers an alkaline soil with a pH between 7 and 8[200]. A very ornamental plant[1], it is widely cultivated around the Mediterranean for its essential oil[50]. The blooms, which are almost intoxicatingly scented, have an undertone of orange in their perfume[245]. The double form, 'flora Pleno' is even more powerfully scented[245].

### 5.2.830 Solidago virgaurea

Goldenrod  
4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli kcaak0 tcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwis hpa7tmwatli fyfxre7t hjonli

drutta Solidago virgaurea is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is obtained from the leaves[46, 61, 183].

tcanta DyeMustard, orange and brown dyes can be obtained from the whole plant[168]. A yellow dye is obtained from the leaves and flowers[4, 100].

dwatta Anthelmintic Anticoagulant Antifungal Antiinflammatory Antirheumatic Antiseptic Aromatic Astringent Carminative Diaphoretic Diuretic Febrifuge Hypoglycaemic Stimulant TB UrinaryGoldenrod is a safe and gentle remedy

on mammalian intestines, it also reduces blood pressure, reduces body temperature caused by fever and protects against stress ulcers[250]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta An easily grown plant, it does best in a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1, 200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Very cold resistant[74], tolerating temperatures down to at least -25°C[187]. A very ornamental[74] and long-lived plant, specimens can survive in the garden for at least 50 years[200]. This species is closely related to *P. veitchii*, differing mainly in only having one flower to a stem[250]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if they flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1].

### 5.2.825 Incarvillea sinensis

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.9 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Incarvillea sinensis is a ANNUAL/PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - cooked. A famine food, it is only used when all else fails[179]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta SkinThe plant is used to treat skin ailments, spongy gums and ulcers[218].

propta Seed - sow autumn or spring in a greenhouse. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow on for at least their first winter in a greenhouse and plant out into their permanent positions in spring after the last expected frosts. Division with care in early spring or autumn.

nwatta Easily grown in a deep well-drained sandy but rich soil in full sun[1, 200]. Plants grow better if they are given some shade around midday[200]. Dislikes dry summer soils and winter wet[200]. One report says that this species

should be grown in a greenhouse[1] whilst another says that it is hardy to about -15°, tolerating lower temperatures if the roots are well mulched, preferably with dry bracken[200]. The crown of the plant requires protection from slugs in the winter[187]. A very ornamental plant, it usually takes about 1 - 2 years to come into flower from seed[1]. A variable species[214], some forms are perennial whilst others are annual[1]. *I. sinensis sinensis* is an annual whilst *I. sinensis variabilis* (Batal.)Grierson is a perennial[200]. Plants are intolerant of root disturbance, it is best to place them in their permanent positions whilst small[200]. The plants will often sulk for several years if they are divided[214].

### 5.2.826 Hosta sieboldii

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Hosta sieboldii is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves StemEdible Uses: Young leaves and leaf stems - cooked[105, 177]. Not very tasty[116].

tcanta Suitable for ground cover, the plants should be spaced about 35cm apart each way[208].

dwatta None known

propta Seed - sow spring in a lightly shaded position in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. Make sure you keep the compost moist. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division is possible at almost any time of the year so long as there is sufficient moisture[233]. It is best carried out in March as growth commences or in early autumn if the soil is not too dry[200]. Hostas can be left undivided for many years and should not be divided any more frequently than once every 3 - 5 years to allow the leaves to reach maturity[200].

nwatta Thrives in most fertile soils if they are rich in humus[200]. Grows well in heavy clay soils and in sandy ones[208]. Very limy soils inhibit growth, but plants can thrive in such a situation if plenty of humus is added[208]. Prefers a pH between 6 and 7[200]. Requires a rich soil that does not dry out readily[1]. This species tolerates dryish conditions[121]. Succeeds in full sun as well as in deep shade, growing well in the semi-shade of a woodland[200, 233]. In general, the sunnier the position the moister the soil should be[233]. Plants are best not grown under trees in town gardens since the soot washed from the leaves of the trees in wet weather will tend to remain on the hosta[208]. Plants flower better when grown in a sunny position but the foliage is better when the plant is in a shady position[200]. The leaves turn yellowish when the plant is grown in full sun[121]. Plants are in general fully hardy in Britain, but young leaves in spring can be destroyed by frost. New leaves are only produced in the spring and very early summer, so any damage at this time has a deep effect on the plant[233]. Forming medium-sized clumps, the rhizome is short and creeping[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants are very attractive to slugs and snails, the young shoots in spring are especially at risk[111, K]. There are some named forms, selected for their ornamental value[187]. Hybridizes freely with other members of this genus[200].

### 5.2.827 Hosta rectifolia

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc pcmihmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

coughs, flatulence etc[4]. The juice of the plant has been used in treating earaches and chewing a leaf or two is said to quickly bring relief from giddiness, nervous headaches, palpitations etc[4]. An alkaloid found in the plant is abortifacient, anti-inflammatory and antispasmodic[218]. A homeopathic remedy is obtained from the fresh herb, harvested in early summer shortly before flowering begins[232]. This is used in the treatment of a variety of complaints including eye strain, headache and sprains[232].

propta Seed - best sown as soon as it is ripe in a cold frame[200], it can also be sown in early to mid spring in a cold frame[14, 27]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of young shoots in late spring[1]. Cuttings of half-ripe wood, July/August in a frame[200]. Very easy[K]. Layering in early summer. Old plants often self-layer[200].

nwatta Landscape Uses:Border, Container, Massing, Rock garden, Specimen. Succeeds in any soil but is hardier in a poor dry soil[4, 37, 200]. Prefers an open sunny position[7, 182]. Prefers a partially shaded sheltered dry position but succeeds in full sun[1, 4, 200]. Prefers a well-drained or rocky soil[200]. Likes some lime in the soil[1]. Established plants are drought tolerant[190]. Hardy to about -10°C, possibly to lower temperatures when it is grown in a dry soil[187]. Often cultivated as a culinary and medicinal herb, there are some named varieties[187]. The bruised leaves have a pleasant orange-like fragrance[245]. It is one of the most pleasant herbs to inhale[245]. Rue releases its scent in a remarkable way. The essential oil is contained in a cavity immediately beneath the surface of the leaf, above which is a thin layer of cells pierced by a cavity in the middle. The cells swell up and bend inwards, pressing on the essential oil beneath, which is driven to the surface of the leaf and there released[245]. Rue is a poor companion plant for many other species, growing badly with sage, cabbage and sweet basil[14, 18, 20, 201]. It is a good companion for roses and raspberries[201]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Edible, Not North American native, Suitable for cut flowers, Suitable for dried flowers.

### 5.2.816 Carlina acanthifolia

4 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyixre7t hjonli

drutta Carlina acanthifolia is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowering head - cooked. Used as a globe artichoke substitute[2, 105, 177, 183], though they are considerably smaller and even more fiddly[K].

tcanta None known

dwatta None known

propta Seed - surface sow in a cold frame in the spring. The seed usually germinates in 4 - 8 weeks at 15°C[138]. As soon as they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in spring[111]. Difficult to do successfully because the plant resents root disturbance[138].

nwatta Succeeds in a sunny position in ordinary garden soil[111]. Prefers an alkaline soil[138]. Prefers a poor soil[200]. Plants are hardy to about -15°C[200]. A very ornamental plant[1]. This species resents root disturbance, it should be planted into its final position as soon as possible[138].

### 5.2.817 Trillium ovatum

Wakerobin, Pacific trillium, Oettinger's trillium, Hibberson's trillium

4 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.4 m hkuc pcmihmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Trillium ovatum is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: The leaves are sometimes cooked for greens[212].

tcanta None known

dwatta Birthing aid Ophthalmic SkinA decoction of the fresh or dried powdered root is used as a treatment for sore eyes[207]. The fresh root juice can be dripped into an afflicted eye[257]. The juice of the plant can be applied externally as a treatment for boils[257]. A poultice of the root can be used as a treatment for boils[257]. The thick underground root stalks were used by some native North American Indian tribes during childbirth[212].

propta Seed - best sown in a shaded cold frame as soon as it is ripe[134, 200]. Stored seed should be sown in late winter or early spring. Seed usually germinates within 1 - 3 months at 15°C. Another report says that seeds produce a root after the first cold stratification but no shoot is produced until after a second winter[138], whilst yet another report says that the seed can take 3 years to germinate[238]. The seedlings are prone to damp off and must therefore be watered with care and given plenty of fresh air[138]. The young plants need to be overwintered in a cold frame for the first year and can then be planted out in late spring. It is very important that the pots become neither too dry nor too wet[138]. Division with care when the plants die down after flowering[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Prefers a deep well-drained woodland or humus-rich soil in a somewhat shady position that remains moist in the summer[1, 42]. Prefers a neutral to slightly acid soil[200]. Grows well in open woodland[1]. Succeeds in deep shade[188]. Succeeds in a sunny position if the soil does not dry out[42]. Any transplanting is best done whilst the plants are in flower[200]. Plants can flower in two years from seed[138]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233], though slugs are very fond of the leaves[238].

### 5.2.818 Paeonia lactiflora

Chinese Peony, Peony

4 tin 10 cyuc 1 kcaak 0 tcan 3 dwat 0.8 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli fyixre7t hjonli

drutta Paeonia lactiflora is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Root. Seed StemEdible Uses: Root - cooked and eaten in a broth[2, 4, 46, 183]. Stems - cooked[177]. Seed - powdered and mixed with tea[4, 183].

tcanta None known

dwatta Alterative Analgesic Anodyne Antibacterial Anti-inflammatory Antiseptic Antispasmodic Astringent Carmine-ant Diuretic Emmenagogue Expectorant Febrifuge Hypotensive Nervine Tonic Women's complaintsThe root of Chinese peony has been used for over 1,500 years in Chinese

medicine. It is known most widely as one of the herbs used to make 'Four Things Soup', a woman's tonic, and it is also a remedy for gynaecological problems and for cramp, pain and giddiness[254]. When the whole root is harvested it is called Chi Shao Yao, if the bark is removed during preparation then it is called Bai Shao Yao[250]. The root is alterative, analgesic, anodyne, antibacterial, anti-inflammatory, antiseptic, antispasmodic, astringent, carminative, diuretic, emmenagogue, expectorant, febrifuge, hypotensive, nervine and tonic[176, 218, 238, 279]. The most important ingredient medicinally in the root is paeoniflorin, which has been shown to have a strong antispasmodic effect on mammalian intestines, it also reduces blood pressure, reduces body temperature caused by fever and protects against stress ulcers[250]. It is taken internally in the treatment of menstrual disorders, injuries, high blood pressure, pre-menstrual tension and liver disorders[238]. It should only be used under the supervision of a qualified practitioner and should not be prescribed for pregnant women[238]. The roots are harvested in the autumn from cultivated plants that are 4 - 5 years old and are boiled before being sun-dried for later use[238, 250]. The roots of wild plants are harvested in the spring or (preferably) in the autumn and are sun-dried for later use[238]. The root is an ingredient of 'Four Things Soup', the most widely used woman's tonic in China[254]. The other species used are *Rehmannia glutinosa*, *Ligusticum wallichii* and *Angelica sinensis*[254]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Landscape Uses:Border, Foundation, Massing, Seashore, Specimen. An easily grown and undemanding plant[250], it does best in a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1, 200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Prefers a rich heavy soil that is well-drained but remains moist in the summer[187]. The species is hardy to about -25°c, but there are many named varieties some of which are hardy to about -50°[187]. Cultivated as a medicinal plant in China[178]. A very ornamental[1] and long-lived plant, surviving in gardens for 50 years or more[200]. Many hundreds of named varieties have been developed for their ornamental value[250]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover if it is transplanted[1]. Plants should be planted with their crowns no more than 3cm below soil level. If planted deeper they do not flower so well[187]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

### 5.2.819 Sedum telephium

Orpine

4 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 0.5 m hkuc pcmhmmihtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum telephium is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Leaves RootEdible Uses: Leaves - raw or cooked[2, 12, 55, 66, 115, 183]. They have occasionally been used in salads[4]. Root - cooked. Used in soups, stews etc[12].

tcanta None known

dwatta Astringent Cytostatic SkinThe whole plant is astringent and cytostatic[4, 66]. It is a popular remedy for diarrhoea, stimulates the kidneys and has a reputation in the treatment of cancer[4]. A poultice of the crushed leaves has been used in the treatment of boils and carbuncles[257].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings can be taken at almost any time in the growing season, though early in the season is probably best.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil that is not too dry[187]. Tolerates poor soils[233]. Succeeds in most soils and is tolerant of quite deep shade[219]. Established plants are drought tolerant[190], they grow well in dry soils and can be grown in crevices on walls[219]. Hardy to about -20°c[187]. This species has pink to red flowers[200]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Polymorphic, intergrading with *S. caucasicum* where their ranges meet. Plants in this genus seem to be immune to the predations of rabbits[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

### 5.2.820 Rhodiola rhodantha

Queen's Crown, Redpod stoncrop

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Rhodiola rhodantha is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked as a potherb[183, 212]. Chopped finely and added to salads[183]. Best used when they are young[83].

tcanta None known

dwatta None known

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse for their first winter. Plant out in early summer of the following year. Division in spring or early summer. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. A good plant for the flower border[83]. This species has pink to white flowers[200]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85].

### 5.2.821 Cystopteris bulbifera

Berry Bladder Fern, Bulblet bladderfern

4 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc pcmhmmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Cystopteris bulbifera is a deciduous Fern growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen from August to October. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root. An emergency food, it is only used when all else fails[172].

tcanta A good ground cover plant[200]. Forming a slowly spreading clump, it should be planted 30cm apart each way[208].

dwatta None known

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Germinates in 1 - 3 months at 20°c[164].Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Division in spring. Bulbils are produced at intervals along the midrib and these can be planted into pots as soon as they are ripe[188, 219].

nwatta Prefers a shady position in a moist but well-drained soil, succeeding in most soil types[200]. Plants can tolerate up to 4 hours direct sun per day[200]. Prefers a pH between 6.5 and 7, but tolerates a range from 5.5 to 7.5[200]. Plants can be grown on old mortared walls if they are in a shady position[219]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants die back early in dry seasons[200]. This plant produces bulbils on the leaves, these fall off when mature and grow into new plants[200, 235]. In this way the plant can become invasive[200].

### 5.2.822 Hordeum jubatum

Foxtail Barley, Intermediate barley

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hordeum jubatum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[2, 105, 161, 257]. The seed can be ground

into a flour and used as a cereal in making bread, porridge etc[177, 183]. Native North Americans would eat the dry flour raw[257]. The seed is exceedingly small and fiddly to use[K]. The roasted seed is used as a coffee substitute[183].

tcanta None known

dwatta The dry root can be wrapped, then moistened and used as a compress for styes in the eyes or on swollen eyelids[257].

propta Seed - sow in situ in March or October and only just cover the seed. Make sure the soil surface does not dry out if the weather is dry. Germination takes place within 2 weeks. Division in spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a rather dry soil[1] and a sunny position[200]. Succeeds in most soils and in climates ranging from sub-arctic to sub-tropical[171]. Easily grown in light soils[162]. Established plants are drought resistant[190]. A very short-lived plant, it is often only an annual[162], though it often self sows a little[190].

### 5.2.823 Acinos rotundifolius

4 tlin 8 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Acinos rotundifolius is a ANNUAL/PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Edible Uses: CondimentThe leaves are used as a flavouring with beans etc, and are said to be a substitute for summer savoury, *Satureia hortensis*[200], though we prefer that species[K].

tcanta None known

dwatta Aphrodisiac StimulantAphrodisiac, stimulant[61].

propta Seed - sow early spring in a cold frame. If you have sufficient seed then you could try sowing in situ in April or May. Germination should take place within a month. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Succeeds in almost any well-drained soil, doing well in a hot dry soil[200].

### 5.2.824 Paeonia anomala

Anomalous peony, Common Peony

4 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Paeonia anomala is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Root - dried and cooked with protein foods[74, 250]. Young shoots - cooked[177].

tcanta None known

dwatta Antispasmodic Antitussive Astringent Febrifuge Hypotensive StomachicThe root is astringent and stomachic[61]. The Chinese herb Chi Shao Yao is made from the whole root of a number of peony species, especially *P. lactiflora*, but also occasionally this species[250]. The most important ingredient medicinally in the root is paeoniflorin, which has been shown to have a strong antispasmodic effect

conditions and so this species gradually dies out as the other trees become established[K].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Thrives on poor and dryish soils, even on chalk, but prefers to be near water[11, 200]. Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils. Tolerates very infertile sites[11, 200]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. A very ornamental tree[1], it is very fast growing, reaching 12 metres tall in 20 years in an exposed maritime position at Rosewarne in N. Cornwall[75]. Very tolerant of salt winds, it establishes rapidly in exposed positions[75]. According to World Economic Plants, the correct author of this species is (Loisel.)Loisel. and not Desf. as we have given here. However, since all our other sources have quoted Desf., we have decided not to alter it at this time (1999)[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.1.34 Gleditsia aquatica

Water Locust

tfo2n 5 tlin 9 cyuc 0 kcaak 0 tcan 0 dwat 12 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Gleditsia aquatica is a deciduous Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from July to August, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Soil stabilization WoodHaving an extensive root system, it is planted for stabilizing wet banks and marshes[200]. Wood - heavy, very hard, strong, durable in contact with the soil, coarse-grained[82, 229]. It weighs 46lb per cubic foot[235]. The wood is extremely durable and is used primarily for making fence posts[229].

dwatta None known

propta Seed - pre-soak for 24 hours in warm water and then sow in spring in a greenhouse[78]. The seed should have swollen up, in which case it can be sown, if it has not swollen then soak it for another 24 hours in warm water. If this does not work then file away some of the seed coat but be careful not to damage the embryo[78]. Further soaking should then cause the seed to swell. One it has swollen, the seed should germinate within 2 - 4 weeks at 20°C. As soon as they are large enough to handle, prick the seedlings out into individual deep pots and plant them out into their permanent

positions in the summer. Give the plants some protection from the cold for their first few winters outdoors.

nwatta Easily grown in a loamy soil, requiring a sunny position[11]. Succeeds in most soils[200]. Tolerates atmospheric pollution[200]. Rather tender when young, it grows best in S. Britain[11]. A slow-growing tree[11], it is growing well at the Hillier Arboretum in Hampshire where a tree was 7 metres tall and 8 metres wide in 1993[K]. Trees have a light canopy, they come into leaf late in the spring and drop their leaves in early autumn[200] making them an excellent top storey tree in a woodland garden. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.35 Caragana decorticans

tfo2n 5 tlin 9 cyuc 0 kcaak 0 tcan 0 dwat 5.4 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjtut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Caragana decorticans is a deciduous Shrub growing to 5.4 m (17ft 9in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Leather StringThe bark is used as a binding material[146], it takes a good polish and when new resembles leather in appearance[11].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Prefers full sun and a light sandy dry or well-drained soil[1, 11, 200]. Does not require a rich soil, succeeding on marginal land[11]. This species is hardy to at least -15°C[200], it prefers a continental climate with hot summers and cold winters so it does not grow so well in the milder western half of Britain[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.36 Ceanothus species

tfo2n 5 tlin 9 cyuc 0 kcaak 0 tcan 0 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Ceanothus species is an evergreen Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta A green dye is obtained from the flowers[168]. All parts of the plant are rich in saponins - when crushed and

dwatta The root is analgesic, astringent, expectorant and febrifuge[257]. A poultice has been used in the treatment of pain, fevers and diarrhoea[257]. The ooze of the roots has been sniffed in the treatment of catarrh[257]. A decoction of the whole plant has been used in the treatment of all kinds of fevers and in the treatment of weak skin[257].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Container, Foundation, Massing, Rock garden, Seashore. Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200], but it also succeeds in partial shade[233]. Prefers a rich soil[1], but tolerates poor ones[233]. Plants are hardy to about -25°C[187]. A polymorphic species, there are many named varieties selected for their ornamental value[200]. Hybridizes freely with other members of this genus[200]. Plants need to be divided every few years, preferably in the spring, in order to keep the plant vigorous[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. Attracts butterflies and moths, it is also a good bee plant providing nectar in autumn[30]. Special Features: Attracts birds, North American native, Wetlands plant, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.897 Astrantia major

Great Masterwort

4 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyifxre7t hjonli

drutta Astrantia major is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles, insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Diuretic PurgativeA decoction of the root is purgative[7]. The root is harvested in summer to early autumn and can be dried for later use[7]. An infusion of the whole plant is a gentle diuretic[7].

propta Seed - best sown in a cold frame as soon as it is ripe[200]. Sow stored seed as early in the year as you can obtain it. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed then it can be sown in situ either as soon as it is ripe or in the following spring. Division in

spring. Large clumps can be planted out straight into their permanent positions. Smaller clumps are best potted up and kept in a cold frame until they are growing away well and can then be planted out in the summer.

nwatta Landscape Uses:Alpine garden, Border, Massing, Seashore, Woodland garden. Prefers a fertile moisture-retentive soil[200]. Succeeds in most well-drained soils[233] in full sun or part shade[200, 233]. Succeeds in an open woodland and along the sides of streams so long as the soil is well above the water level[200]. Plants are hardy to at least -17°C[200]. Plants spread by means of underground runners[233]. There are some named varieties, selected for their ornamental value[200]. The flowers are sometimes dried and used for winter decoration[200]. Special Features:Attractive foliage, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

## 5.2.898 Gillenia stipulata

American Ipecacuanca, American ipecac

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 1.2 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Gillenia stipulata is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Cathartic Diaphoretic Emetic Expectorant Odonatalgic Stings TonicThe dried powdered root bark is cathartic, slightly diaphoretic, a mild and efficient emetic, expectorant and tonic[4, 61, 213, 238]. Minute doses are used internally in the treatment of colds, chronic diarrhoea, constipation, asthma and other bronchial complaints[238, 257]. The roots have been used externally in the treatment of rheumatism[257]. A cold infusion of the roots has been given, or the root chewed, in the treatment of bee and other stings[257]. The roots are harvested in the autumn, the bark is removed and dried for later use[213, 238]. A tea made from the whole plant is strongly laxative and emetic[222]. Minute doses are used internally in the treatment of colds, indigestion, asthma and hepatitis[222]. A poultice or wash is used in the treatment of rheumatism, bee stings and swellings[222]. A decoction or strong infusion of the whole plant has been taken a pint at a time as an emetic[257]. A poultice of the plant has been used to treat leg swellings[257]. The plant has been used in the treatment of toothaches[257].

propta Seed - sow spring or autumn in a cold frame[200].

Prick out the seedlings when they are large enough to handle and grow on for the first year in a lightly shaded area of the greenhouse or cold frame. Plant out in late spring and protect from slugs until well established. Division in spring or autumn[238].

nwatta Easily grown in a rather moist but well-drained lime-free peaty soil in semi-shade[4, 200]. Succeeds in a sunny position but requires shade at the hottest part of the day[200].

## 5.2.899 Peucedanum oreoselinum

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyifxre7t hjonli

drutta Peucedanum oreoselinum is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta EssentialThe plant yields an essential oil[61]. No further details on use or what part of the plant the oil is obtained from.

dwatta DiureticDiuretic[61].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though since its native range is all of Europe except the islands and extreme north and south, it should succeed outdoors in this country. The following notes are based on the general needs of the genus. An easily grown plant, it succeeds in any moisture-retentive soil in a sunny position[200]. Suitable for group plantings in the wild garden[200].

## 5.2.900 Dactylis glomerata

Cock's Foot, Orchardgrass, Ascherson's orchardgrass 4 tlin 8 cyuc 0 kcaak 2 tcan 1 dwat 1 m hkuc hmimhtut cyutli hgattcup hwicli hrasjltutnykfrp hpa7tli frusflatprikwissip hpa7tmwatli xre7t hjonli

drutta Dactylis glomerata is an evergreen Perennial growing to 1 m (3ft 3in) by 0.3 m (1ft). It is leafy for USDA hardness. It is hardy to UK zone 5. It is in bloom all year, in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcaakta None known

tcanta Fodder Miscellany Soil stabilizationEnvironmental:Erosion control or dune stabilization, Land reclamation, Revegetation, Soil conservation. Plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover[200]. Having a deep root system, the plant is also useful for checking soil erosion[269]. The plant can be grown for biomass, annual productivity ranges from 2 to 37 tonnes per hectare[269]. If soil fertility is low, a large portion of the total production occurs in the spring, but if the soil is highly fertile, production is well distributed throughout the growing season[269]. Animal feed, fodder, forage.

dwatta MiscellanyReported to be oestrogenic. the plant is a folk remedy for treating tumours, kidney and bladder ailments

propta Seed - surface sow in a cold frame in the spring and do not allow the compost to dry out[162]. Germination should take place within three weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. There is between 725,000 and 1,450,000 seeds per kilo[269]. If you have sufficient seed it can be sown outdoors in situ in the spring. Division in spring[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most good soils and also under the shade of trees[1, 115, 162]. Prefers a light well-drained soil, it does not thrive on heavy or poorly drained soils[200]. Plants tolerate an annual precipitation in the range of 31 to 176cm, an annual temperature range of 4.3 to 23.8°C and a pH in the range of 4.5 to 8.2[269]. The plant is adapted to humid temperate climates. It grows on almost any type of soil, but thrives best on heavier types, such as clays and clay loams. A drought-resistant plant, it will withstand high temperatures. Prefers areas with 480-750 mm annual rainfall, but will produce on rather poor dry soils[269]. Plants are hardy in all parts of Britain, though they are less winter-hardy than *Phleum pratense* or *Bromus inermis* and do not extend as far north in Europe[269]. A very variable plant[1]. There are both diploid and triploid forms[274]. Numerous strains have been developed, some coarse and stemmy, others good for hay and early grazing. Local ecotypes in the Mediterranean region are adapted to long hot dry summers. In Europe two types have been developed, one for pasture and one

for hay. Pasture types produce more basal leaves and generally are more spreading than the hay types. Selections made in Canada, Sweden and Finland are improved for winter hardiness. Improved strains are more leafy, persistent and later flowering than unimproved commercial types[269]. An important food plant for the caterpillars of several lepidoptera species[30]. The plant is occasionally grown for lawns and is particularly well adapted for growing under shade[269]. However, this species does not make a good lawn grass because it is too coarse[1].

## 5.2.901 Hyoscyamus niger

Henbane, Black henbane

4 tlin 8 cyuc 0 kcaak 0 tcan 4 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjltutnyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hyoscyamus niger is an ANNUAL/BIENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaakta None known

tcanta RepellentThe leaves scattered about a house will drive away mice[207].

dwatta Anodyne Anthelmintic Antispasmodic Antitumor Diuretic Epilepsy Febrifuge Hallucinogetic Hypnotic Mydriatic Narcotic Sedative UrinaryHenbane has a very long history of use as a medicinal herb, and has been widely cultivated to meet the demand for its use[4]. It is used extensively as a sedative and pain killer and is specifically used for pain affecting the urinary tract, especially when due to kidney stones[254]. Its sedative and antispasmodic effect makes it a valuable treatment for the symptoms of Parkinson's disease, relieving tremor and rigidity during the early stages of the disease[254]. This species is the form generally considered best for external use, whilst the white henbane (*H. albus*) is considered the most appropriate for internal use[4]. All parts of the plant, but especially the leaves and the seeds, can be used - they are anodyne, antispasmodic, mildly diuretic, hallucinogenic, hypnotic, mydriatic, narcotic and sedative[4, 9, 13, 21, 100, 165, 192, 218]. The plant is used internally in the treatment of asthma, whooping cough, motion sickness, Meniere's syndrome, tremor in senility or paralysis and as a pre-operative medication[238]. Henbane reduces mucous secretions, as well as saliva and other digestive juices[254]. Externally, it is used as an oil to relieve painful conditions such as neuralgia, dental and rheumatic pains[238, 254]. The leaves should be harvested when the plant is in full flower and they can then be dried for later use[4]. There is an annual and a biennial form of this species, both can be used medicinally but the biennial form is considered to be superior[4]. This is a very poisonous plant that should be used with great caution, and only under the supervision of a qualified practitioner[21, 238]. See the notes above on toxicity. The seed is used in the treatment of asthma, cough, epilepsy, myalgia and toothache[218]. The seeds are used in Tibetan medicine, they are said to have a bitter, acrid taste with a neutral and poisonous potency[241]. Anthelmintic, antitumor and febrifuge, they are used in the treatment of stomach/intestinal pain due to worm infestation, toothache, inflammation of the pulmonary region and tumours[241].

propta Seed - sow summer in a cold frame and pot on as soon as possible before the taproot is too long[200].

nwatta Prefers a sunny position[4] and a dry soil[19]. Succeeds in ordinary garden soil[1] but prefers an alkaline soil[200]. Plants succeed in sandy spots near the sea[4]. Cultivated commercially as a medicinal plant[57], only the biennial form is considered official[4]. Grows well in maritime areas, often self-sowing freely[200]. Older plants do not transplant well due to a brittle taproot[200]. The growing plant inhibits the growth of clover[18]. The flowers emit a sickly fishy smell[245].

are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants are very intolerant of root disturbance and so should be planted into their permanent positions as soon as possible, though not until after the last expected frosts[78]. Cuttings of half-ripe wood, 7cm with a heel, July/August in a frame. Pot up in spring as soon as rooting commences and plant out into their permanent positions as soon as possible[78].

nwatta An easily grown plant, it requires a poor soil and a sunny position to be at its best[11]. It does well on dry sunny banks or in poor gravelly soils[11]. It is intolerant of shade, nor does it do well on rich soils[11, 182]. Prefers a neutral to slightly acid soil[200], disliking alkaline soils[17]. Plants are very intolerant of root disturbance[11]. Very tolerant of maritime exposure and, once established, drought[75, 186, 200]. Although native to Britain and said to be hardy to about -20°C[184], gorse often suffers badly in severe winters[4, 17], but the plants usually recover[186]. They often accumulate dry dead spines at their centre, this can be a fire risk in dry summers[186, 200]. The plants often re-sprout from the base after a fire[200] and, even if killed, numerous seedlings will soon spring up to replace the dead plants[186]. Hybridizes freely with other members of this genus[200]. The flowers are strongly scented of coconut[K]. Another report says that the flowers have a smell of vanilla with undertones of orange or pineapple[245]. It is one of the most refreshing of all flower scents[245]. A food plant for the caterpillars of several lepidoptera species[30]. Plants often form dense thickets and these are ideal nesting areas for many species of birds[186]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 6.1.31 Lespedeza buergeri

tfo2n 5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjltut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lespedeza buergeri is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves and plant tops - cooked[105, 177].

tcanta None known

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[1]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the ground in all but very mild winters, though they generally re-sprout well from the base in the following spring and flower in late summer[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules

on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.32 Psoralea orbicularis

Roundleaf Leather Root

tfo2n 5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.1 m hkuc htut cyutli kyuctcup hwicli hrasjltutnyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Psoralea orbicularis is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 161, 257].

tcanta Soil stabilizationThe plant is a good soil stabilizer in its natural environment[200].

dwatta Blood purifier FebrifugeA decoction of the root used as a blood purifier and in the treatment of fevers[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in early to mid spring in a greenhouse. Either sow the seed in individual pots or pot up the young seedlings as soon as possible in order to avoid root disturbance. Grow them on in the pots until planting out in their final positions. It is usually impossible to transplant this species without fatal damage to the root[200]. Division in spring. With great care since the plant resents root disturbance. It is virtually impossible to divide this species successfully[200].

nwatta Succeeds in an ordinary garden soil[1]. We have very little information on this species but it is growing at Kew in the system beds and seems to be thriving there[K]. Plants are very intolerant of root disturbance, they are best planted out into their permanent positions whilst still small[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.33 Alnus cordata

Italian Alder

tfo2n 5 tlin 9 cyuc 0 kcaak 4 tcan 0 dwat 25 m hkuc hmimhtut cyutli kyuctcuphja7n hwicli hysjltutnykfrp hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Alnus cordata is a deciduous Tree growing to 25 m (82ft) by 8 m (26ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 6. It is in leaf from April to December, in flower in March. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil. The plant can tolerate maritime exposure.

kcaakta None known

tcanta Hedge Pioneer ShelterbeltAn excellent wind-break for maritime areas[75], it grows quite quickly and establishes well even in very windy sites[K]. Trees 5 years old from seed have reached 4 metres in height and are showing no signs of wind-shaping in a very exposed site in Cornwall[K]. It is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland



nwatta An easily grown plant, succeeding in any moderately good garden soil but preferring a position in full sun[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.28 Onobrychis viciifolia

Sainfoin  
tfo2n 5 tlin 9 cyuc 1 kcaak 4 tcan 0 dwat 1 m hkuc  
htut cyutli tcup hwicli hyhshrasjlut hpa7tli priklwisslip hpa7tmwatli dyatkre7t hjonli

drutta Onobrychis viciifolia is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: One report says that the plant is edible[20], but does not say what part of the plant is used.

tcanta Soil conditioner Soil stabilizationA good soil conditioner for poor light soils[115]. The plants can be grown on the land for a number of years, the deep tap roots breaking up the sub-soil and bringing up minerals from below. Plants can be cut during the growing season but care must be taken not to cut too low because the tap root tends to rise above ground level and the plant can be killed if this is cut off[115]. The plant has an extensive root system and is useful for stabilizing soils[160, 200]. Nitrogen Fixer.

dwatta None known  
propta Seed - pre-soak for 12 hours in warm water and sow in situ in the spring[1, 200]. Seed can also be sown in situ in the autumn. If seed is in short supply then it might be wiser to sow it in pots in a cold frame in early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in early summer. Division in the spring just before new growth commences[200]. Large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a well-drained neutral to alkaline sandy loam in full sun[1, 200]. Succeeds in poor soils[115] and in shallow soils over chalk[200]. Dislikes shade. Does not succeed in wet soils[115]. A good border plant for the vegetable garden[18, 20], the deep tap root helps to break up the sub-soil[115]. Plants are resistant to alfalfa stem nematodes[160] and are immune to bacterial wilt disease and attacks by the alfalfa stem weevil[160]. A good bee plant[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.29 Melilotus indicus

Annual Yellow Sweetclover  
tfo2n 5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli priklwis hpa7tmwatli xre7t hjonli

drutta Melilotus indicus is a ANNUAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105].

tcanta Fodder RepellentThe leaves repel insects. They have been placed in beds to repel bedbugs[257].

dwatta Antibacterial Anticoagulant Astringent Emollient Laxative Narcotic PouliticeThe seed is made into a gruel and used in the treatment of bowel complaints and infantile diarrhoea[218, 240]. The plant is discutient, emollient, astringent, strongly laxative and narcotic[218, 240, 257]. It is used externally as a poultice or plaster on swellings[218, 240]. The plant contains coumarin, which is an anticoagulant[218]. The plant also contains dicumarol, which is a broad spectrum bactericide[218].

propta Seed - sow spring to mid-summer in situ[87]. Pre-soaking the seed for 12 hours in warm water will speed up the germination process, particularly in dry weather[K]. Germination will usually take place within 2 weeks.

nwatta Dislikes shade. This species is often cultivated as a fodder crop and cultivars low in coumarin have been developed[218]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

## 6.1.30 Ulex europaeus

Gorse, Common gorse  
tfo2n 5 tlin 9 cyuc 1 kcaak 5 tcan 1 dwat 1.5 m hkuc  
htut cyutli hgatkyuctup hwicli hyhshrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Ulex europaeus is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower all year, and the seeds ripen all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: FlowersEdible Uses: TeaThe flower buds are pickled in vinegar and then used like capers in salads[183]. A tea is made from the shoot tips[177, 183].

tcanta Dye Fertilizer Fuel Hedge Hedge Insecticide Pioneer Soap making Soil stabilizationA beautiful yellow dye is obtained from the flowers[4]. It is orange according to another report[168]. Gorse is very tolerant of maritime exposure, it can be used as a windbreak hedge in the most exposed positions, making an impenetrable barrier with its vicious thorns[4, 49, 75, 200]. Planted for soil stabilization on sandy substrates[200], it is very good for stabilizing roadside banks on poor soils[186]. Gorse is an excellent pioneer species for poor soils and areas with maritime exposure. It is fast-growing, feeds the soil with nitrogen and provides good conditions for woodland trees to become established. These trees will eventually out-compete the gorse, which is unable to reproduce well in the shady conditions and will thus gradually die out[K]. The plant has an old reputation as a pesticide, the soaked seed being used against fleas[4]. The wood burns very well, it was much used in the past for kindling, heating bakers ovens etc[11, 66]. The ashes from the burnt wood are rich in potassium and can be used in making soap[4, 115]. This soap can be made by mixing the ashes with a vegetable oil, or mixing them with clay and forming them into balls[4]. The ashes are also an excellent fertilizer[4, 115].

dwatta BachGorse has never played much of a role in herbal medicine, though its flowers have been used in the treatment of jaundice and as a treatment for scarlet fever in children[4]. The seed is said to be astringent and has been used in the treatment of diarrhoea and stones[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Hopelessness' and 'Despair'[209].

propta Seed - pre-soak 24 hours in hot water and sow in individual pots in a greenhouse in late winter to early spring. Germination should take place within 2 weeks. When they

## 5.2.902 Veratrum album

White Hellebore, White false hellebore  
4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Veratrum album is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta InsecticideThe dried and powdered root contains pyrethrums and is used as an insecticide and a parasiticide[1, 7, 19, 20]. It is also effective against caterpillars and mammals so great caution is advised[1, 19, 20].

dwatta Analgesic Anthelmintic Antiemetic Cathartic Emetic Errhine Expectorant Hypnotic SternutatoryThe root is analgesic, anthelmintic, cathartic, emetic, errhine, expectorant, hypnotic and sternutatory[4, 7, 9, 178, 192]. The root is very poisonous, with a paralyzing effect on the nervous system, and is scarcely if ever used internally[4, 7], though the alkaloids it contains are used in the pharmaceutical industry[9]. It is occasionally used externally as a local analgesic, though even this is not without its dangers since it can be absorbed through broken skin[4, 7]. It is also used in veterinary medicine[244]. The root is harvested in early autumn and is dried for later use[7].

propta Unless stored in damp sand at around 4°C the seed has a short viability[200]. Where possible it is best to sow the seed in a lightly shaded position in the greenhouse as soon as it is ripe[200]. Stored seed needs to be stratified but can be very slow to germinate. Germination can be erratic even for seed sown when it was fresh, it usually takes place within 3 - 12 months at 15°C but can be much longer[200]. The plant produces just one seedleaf in its first year, this forms an over-wintering bulb. It takes up to 10 years for the plant to reach maturity[200]. Sow the seed thinly so there is no need to thin or transplant them, and grow the seedlings undisturbed in the pot for their first two years of growth. Apply a liquid feed at intervals through the growing season to ensure the plants do not become nutrient deficient. At the end of the second year plant out the dormant plants into individual pots and grow them on in light shade in the greenhouse for a further year or two before planting them out into their permanent positions in late spring or early summer. Division in March/April or in October. Establish the plants in pots in a shaded frame before planting them out[200]. Division is best carried out in the autumn because the plants come into growth very early in the spring[233]. Root cuttings, 6mm long with a bud, rooted in a sandy soil in a cold frame[200].

nwatta Requires a deep fertile moisture retentive humus-rich soil[200]. Succeeds in full sun if the soil does not dry out but prefers a position in semi-shade[200]. Dislikes dry soils[42]. Grows best in a cool woodland garden or a north facing border[42]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants are long-lived and can be left in the same position for years without attention[233].

## 5.2.903 Herniaria hirsuta

Hairy Rupture Wort  
4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat m hkuc  
htut cyutli hgatkyuctup hwicli hyhshrasjlut hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Herniaria hirsuta is a ANNUAL/PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and

can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta None known  
tcanta SoapA good ground cover plant, allowing spring bulbs to grow through it[200]. An aqueous extract of the plant is a hand cleanser, making the skin soft and supple[240].

dwatta DiureticThe plant is diuretic[240]. It is used in the treatment of sore throats[240]. The plant contains coumarins and saponins, which are toxic, and so it should be used with some caution.

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Grows well in hot dry soils[1]. Dislikes excessive moisture[1]. Succeeds in very poor soils[1]. Useful for covering rocks or as a carpet bedding[1], it makes a good ground cover for spring bulbs since they can grow through it easily[200].

## 5.2.904 Echinacea pallida

Cone Flower, Pale purple coneflower  
4 tlin 8 cyuc 0 kcaak 0 tcan 5 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Echinacea pallida is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Adaptogen Alternative Antiseptic Appetizer Depurative Diaphoretic Digestive Sialogogue UrinaryPlants in this genus were probably the most frequently used of N. American Indian herbal remedies, though this species is considered to be less active than E. angustifolia[222]. They had a very wide range of applications and many of these uses have been confirmed by modern science. The plant has a general stimulatory effect on the immune system and is widely used in modern herbal treatments[222]. There has been some doubt over the ability of the body to absorb the medically active ingredients orally (intravenous injections being considered the only effective way to administer the plant), but recent research has demonstrated significant absorption from orally administered applications[222]. In Germany over 200 pharmaceutical preparations are made from Echinacea[222]. The roots and the whole plant are considered particularly beneficial in the treatment of sores, wounds, burns etc, possessing cortisone-like and antibacterial activity[222]. The plant was used by N. American Indians as a universal application to treat the bites and stings of all types of insects[213]. An infusion of the plant was also used to treat snakebites[213]. The plant is adaptogen, alternative, antiseptic, depurative, diaphoretic, digestive, sialogogue[4, 21, 61, 165, 213]. It is harvested in the autumn and dried for later use[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Echinacea for common cold, cough and bronchitis, fevers and cold, urinary tract infections, inflammation of the mouth and pharynx, increase resistance to infection, wounds and burns (see [302] for critics of commission E).

propta Seed - sow March/April in a greenhouse and only just cover the seed[175, K]. Diurnal temperature fluctuations aid germination[175]. The seed usually germinates in 10 - 21 days at 25°C[175]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse for the first summer. Plant them out in the late spring or early summer of the following year and give them some protection from slugs at least until they are established[K]. Division in spring or autumn[111]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well.

Plant them out in the spring. Root cuttings, October in a frame[200].

nwatta Succeeds in ordinary garden soil[111] but prefers a deep rich loam with plenty of leafmold[1] and a sunny position[175]. Slugs love this plant[K].

### 5.2.905 Populus maximowiczii

Doronoki, Japanese poplar

4 tin 8 cyuc 0 kcaak 2 tcan 1 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Populus maximowiczii is a deciduous Tree growing to 30 m (98ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June, and the seeds ripen from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Rooting hormone WoodAn extract of the shoots can be used as a rooting hormone for all types of cuttings. It is extracted by soaking the chopped up shoots in cold water for a day[172]. Wood - soft, rather woolly in texture, without smell or taste, of low flammability, not durable, very resistant to abrasion. Used for wood pulp, boxes, timber for construction, ship building, and matchwood[11, 46, 61, 266].

dwatta Anodyne Antiinflammatory FebrifugeAlthough no specific mention has been seen for this species, the bark of most, if not all members of the genus contain salicin, a glycoside that probably decomposes into salicylic acid (aspirin) in the body[213, 238]. The bark is therefore anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps[238].

propta Seed - must be sown as soon as it is ripe in spring[113]. Poplar seed has an extremely short period of viability and needs to be sown within a few days of ripening[200]. Surface sow or just lightly cover the seed in trays in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the old frame. If sufficient growth is made, it might be possible to plant them out in late summer into their permanent positions, otherwise keep them in the cold frame until the following late spring and then plant them out. Most poplar species hybridize freely with each other, so the seed may not come true unless it is collected from the wild in areas with no other poplar species growing[11]. Cuttings of mature wood of the current season's growth, 20- 40cm long, November/December in a sheltered outdoor bed or direct into their permanent positions. Very easy. Suckers in early spring[78].

nwatta An easily grown plant, it does well in a heavy cold damp soil[1]. Prefers a deep rich well-drained circum-neutral soil, growing best in the south and east of Britain[11, 200]. Growth is much less on wet soils, on poor acid soils and on thin dry soils[11]. It does not do well in exposed upland sites[11]. It dislikes shade and is intolerant of root or branch competition[200]. Trees are susceptible to bacterial canker[11]. Poplars have very extensive and aggressive root systems that can invade and damage drainage systems. Especially when grown on clay soils, they should not be planted within 12 metres of buildings since the root system can damage the building's foundations by drying out the soil[11]. Dioecious. Male and female plants must be grown if seed is required. Hybridizes freely with other members of this genus[200].

### 5.2.906 Delphinium elatum

Candle larkspur, English Larkspur

4 tin 7 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Delphinium elatum is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a medium rate. See above for

USDA hardiness. It is hardy to UK zone 3. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta The seed contains 1.7% alkaloids and is used as an insecticide[240].

dwatta Anthelmintic Aperient Diuretic EmeticThe whole plant, but especially the seeds, is anthelmintic, aperient, diuretic and emetic[240].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°C[200]. Temperatures above 15°C inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Landscape Uses:Border, Foundation, Massing, Seashore, Specimen. Prefers a rich well-drained soil that stays moist in the summer[111, 187]. Dislikes water-logged soils[200], it is liable to die out in heavy soils over winter[111]. Requires an open sunny position[188]. This species is the main parent of the many tall hybrid forms of delphiniums that are commonly grown as garden ornamentals[200]. A variable species in the wild, varying in height from 40cm to 2 metres[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features: Attracts birds, All or parts of this plant are poisonous, Suitable for cut flowers, Suitable for dried flowers.

### 5.2.907 Saponaria officinalis

Soapwort, Bouncingbet

4 tin 8 cyuc 0 kcaak 0 tcan 3 dwat 1 m hkuc hhmihmt cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Saponaria officinalis is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta SoapA soap can be obtained by boiling the whole plant (but especially the root) in water[6, 13]. It is a gentle effective cleaner[7, 95], used especially on delicate fabrics that can be harmed by modern synthetic soaps (it has been used to clean the Bayeaux tapestry). It effects a lustre in the fabric[171]. The best soap is obtained by infusing the plant in warm water[169]. The roots can be dried and stored for later use[169]. The plant is sometimes recommended as a hair shampoo, though it can cause eye irritations[238]. The plant spreads vigorously and can be used as a ground cover when planted about 1 metre apart each way[208].

dwatta Alternative Antipruritic Antirheumatic Antiscrophulatic Cholagogue Cytotoxic Depurative Diaphoretic Diuretic Expectorant Purgative Skin Sternutatory TonicSoapwort's main medicinal use is as an expectorant. Its strongly irritant action within the gut is thought to stimulate the cough reflex and increase the production of a more fluid mucus within the respiratory passages[254]. The whole plant, but especially the root, is alterative, antiscrophulatic, cholagogue, depurative, diaphoretic, mildly diuretic, expectorant, purgative, sternutatory and tonic[4, 7, 9, 13, 21, 218]. A decoction of the whole plant can be applied externally to treat itchy skin[4, 201, 238]. The plant has proved of use in the treatment of jaundice and other visceral obstructions[4], but

tcanta BasketryThe branchlets may be used for making baskets[266].

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[1]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the ground in all but very mild winters, though they generally resprout well from the base in the following spring and flower in late summer[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.25 Caragana sinica

Chinese Pea Shrub

tfo2n 5 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc htut cyutli hgatkyuctcup hwicli hyhshrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Caragana sinica is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: FlowersEdible Uses: Flowers - raw or cooked[46, 61, 105, 177]. Boiled and washed[179].

tcanta None known

dwatta Antiinflammatory Restorative Tonic VDThe root contains a number of medically active constituents including saponins, stilbenes and caraganosides[279]. It has been shown to have antiinflammatory activity and is used in Korea in the treatment of arthritis, neuralgia, diarrhoea and bone weakness[279]. It is said to be restorative and tonic[74]. The stem is made into a broth with other foods and used in the treatment of advanced syphilis[218].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. It usually germinates in 2 weeks[K]. Stored seed should be pre-soaked for 24 hours in warm water then sown in a cold frame[78, 113, 200]. If the seed has not swollen then scarify it and re-soak for another 12 hours before sowing[138]. Germination usually takes place within 2 - 3 weeks at 20°C[138]. Good percentage[11]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[113]. Layering in spring.

nwatta Prefers full sun and a light sandy dry or well-drained soil[1, 11, 200]. Does not require a rich soil, succeeding on marginal land[11]. This species prefers a continental climate with hot summers and cold winters, it does not grow so well in mild maritime areas such as western Britain. The bark smells like liquorice[182]. This plant is closely related to *C. ussuriensis*. (Rel.)Pojark. (with which it was once united), a low shrub of rocks, forest glades and roadsides[74]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.26 Lupinus polyphyllus

Big-Leaf Lupin, Lupine

tfo2n 5 tin 9 cyuc 1 kcaak 4 tcan 1 dwat 1.5 m hkuc htut cyutli hgattcup hwicli hyhshrasjlutnyik hpa7tli frusflat-prik hpa7tmwatli xre7t hjonli

drutta Lupinus polyphyllus is a PERENNIAL growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from July to August, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Root - raw or cooked[257].

tcanta Landscape Uses: Border, Container, Ground cover, Massing, Specimen, Woodland garden. Special Features: Attracts birds, Attractive foliage, North American native, Naturalizing. Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. Nitrogen fixer.

dwatta A decoction of the plant has been used as a tonic[257].

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a greenhouse[1, 200]. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. It should also be possible to sow the seed in situ in mid spring. It might be necessary to protect the sowing from mice. Division in March. Difficult. Basal cuttings, April in a cold frame. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Agroforestry Services: Nitrogen Management: Standard New Crop Staple Crop: ProteinAn easily grown plant, succeeding in any moderately good soil in a sunny position[1, 200]. It strongly dislikes excessive winter wet[1]. Requires an acid to neutral soil[200]. Succeeds in poor soils[60]. Plants can be naturalized in the wild garden, especially on stream banks and for flowering above rough grass, where they may be short-lived but will self-seed[200]. Plants dislike root disturbance. There are some named varieties, selected for their ornamental value[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.27 Lathyrus davidii

tfo2n 5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.2 m hkuc hhmihmt cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lathyrus davidii is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Seed SeedpodEdi Uses: Seed - cooked[105, 177]. Some caution is advised, see the notes above on toxicity. Young seedpod - cooked[105, 177]. Young plant, including the inflorescence - cooked and used as a potherb or added to soups etc[105, 177, 183].

tcanta None known

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

very drought tolerant once established and grow well on dry banks[4, 11]. Tolerates a smoky atmosphere, growing well in polluted areas[186]. Plants are hardy to about -20°c[184]. A number of named forms have been developed for their ornamental value[182]. New leaves are formed in April but these soon drop off the plant, photosynthesis being carried out by means of the green stems[186]. Very tolerant of cutting, it regenerates quickly from the base[186]. Plants are usually killed by fire but the seeds quickly germinate after the fire and rapidly become established[186]. A good bee plant and food plant for many caterpillars[24, 30, 46], it provides the food for the larvae of the green hairstreak butterfly[186]. Ants are attracted to the seeds, feeding on the juicy attachment that holds them to the pods and thus distributing the seed[186]. Dislikes root disturbance, especially when more than 20cm tall[11]. It is best to plant out into their permanent positions as early as possible. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Naturalizing, Fragrant flowers, Attractive flowers or blooms.

### 6.1.22 Sophora davidii

Sophora  
tfo2n 5 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 2.5 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli xre7t hjonli  
drutta Sophora davidii is a deciduous Shrub growing to 2.5 m (8ft) by 2.5 m (8ft) at a slow rate. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers[177, 183]. No further details are given.  
tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Pre-soak stored seed for 12 hours in hot (not boiling) water and sow in late winter in a greenhouse[78]. Prick out the seedlings as soon as they are large enough to handle into individual pots in the greenhouse, and grow them on for 2 years under protected conditions. Plant them out into their permanent positions in early summer of their third year. Cuttings of young shoots with a heel, July/August in a frame[11]. Air-layering[200].

nwatta Landscape Uses:Specimen. Succeeds in a sunny position in most dry or moist well-drained soils[184]. Requires a good loamy soil[11]. Grows well on chalk[184]. It grows best in the warmer areas of the country where the wood will be more readily ripened and better able to withstand winter cold[219]. Hardy to about -20°c but requires the extra warmth of a wall if it is to flower well[184]. However, a free-standing shrub at Kew is growing very well[184]. A very ornamental plant[1]. Plants should be container-grown and planted out whilst young, older plants do not transplant well[219]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.1.23 Lathyrus latifolius

Perennial Sweet Pea, Perennial pea  
tfo2n 5 tlin 9 cyuc 1 kcaak 2 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli hgatyuctcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli  
drutta Lathyrus latifolius is a PERENNIAL CLIMBER growing to 2 m (6ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost

tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Seed SeedpodEdible Uses: Seed - cooked[105, 177]. Some caution is advised, see the notes above on toxicity. Young seedpod - cooked[105, 177]. Young plant - cooked[105, 177].

tcanta Plants can be grown without supports when they will sprawl on the ground and can be used as a ground cover plant in a sunny position[188, 202]. They should be spaced about 1.5 metres apart each way[208]. They are very vigorous and so are best not used with small plants[K]. They also die down completely in the winter, giving weeds a chance to become established[K].

dwatta None known  
propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta Landscape Uses:Arbor, Container. An easily grown plant, succeeding in any moderately good garden soil[200], whether acid or alkaline[202]. Prefers a position in full sun but tolerates part day shade[200]. Succeeds in dry soils and is drought tolerant when established[190]. Grows well on dry slopes[208]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Plants are hardy to at least -10°c[202]. A very ornamental plant[1], there are many named varieties[187]. It is fast-growing and, when in a suitable position, can become invasive[202]. Plants climb by means of tendrils[188]. Resents root disturbance and can take a year or two to settle down after being moved[219]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:All or parts of this plant are poisonous. Suitable for cut flowers. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also available and given here if available. Herbaceous. A suckering vine sending up suckers some distance main plant [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 6.1.24 Lespedeza cyrtobotrya

Leafy lespedeza  
tfo2n 5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lespedeza cyrtobotrya is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and plant tops - cooked[105, 177].

is rarely used internally in modern herbalism due to its irritant effect on the digestive system[238]. When taken in excess, it destroys red blood cells and causes paralysis of the vasomotor centre[238]. See also the notes above on toxicity[4, 7]. The root is harvested in the spring and can be dried for later use[7]. One of the saponins in this plant is proving of interest in the treatment of cancer, it is cytotoxic to the Walker Carcinoma in vitro[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Saponaria officinalis Soapwort. Bouncingbet for coughs/bronchitis (see [302] for critics of commission E).

propta Seed - best if given a short cold stratification. Sow autumn or late winter in a cold frame. The seed usually germinates within 4 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. Division in spring or autumn. Very easy, it can be successfully done at any time in the growing season if the plants are kept moist until they are re-established. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border, Rock garden. Succeeds in any moderately fertile well-drained soil in sun or semi-shade[200]. Prefers a neutral to alkaline soil[238]. Hardy to about -20°c[187]. A very ornamental plant[1], soapwort is often grown in the herb garden and is sometimes cultivated for the soap that can be obtained from the roots. There are some named forms, usually with double flowers, that have been selected for their ornamental value[187]. Plants can be very invasive when grown in good conditions[K]. Soapwort should not be grown next to a pond with amphibians or fish in it since if the plant trails into the water it can cause poisoning[238]. The flowers are slightly scented with a sweet aroma that has an undertone of clove[245]. Hybridizes with other members of this genus[200]. A good moth plant[13, 24]. Special Features:Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

### 5.2.908 Vinca minor

Lesser Periwinkle, Flower of Death, English Holly, Creeping Myrtle, Creeping Vinca, Common Periwink  
4 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat m hkuc  
pcimhimhtut cyutli hgatyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Vinca minor is an evergreen Shrub growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known  
tcanta BasketryThe stems are used in basket making[7]. A very good ground cover for covering steep banks and shady places, spreading rapidly once established and forming a dense cover within 2 years[11, 28, 31, 190, 200]. It is less dense on dry or exposed sites[197]. Plants are best spaced about 60cm apart each way[208].

dwatta Antispasmodic Astringent Bitter Detergent Homeopathy Hypotensive Sedative Stomachic TonicThe plant is sedative and tonic[21, 53, 165]. It contains the alkaloid 'vincamine', which is used by the pharmaceutical industry as a cerebral stimulant and vasodilator[238]. Since the discovery of vincamine in the leaves, the plant has been used herbally to treat arteriosclerosis and for dementia due to insufficient blood supply to the brain[254]. The leaves are bitter, detergent and stomachic[7]. Taken internally, they are used in the treatment of internal bleeding, heavy menstrual bleeding and nosebleeds[254]. When crushed and applied to wounds they have astringent and healing properties[7]. A mouthwash is used to treat gingivitis, sore throats and mouth ulcers[254]. The leaves are gathered in the spring

and dried for later use[7]. The root is antispasmodic and hypotensive[7, 19]. It is used to lower the blood pressure[19]. The root is gathered in the autumn and dried for later use[7]. The fresh flowers are gently purgative, but lose their effect on drying[4]. A homeopathic remedy is made from the fresh leaves[4]. It is used in the treatment of haemorrhages[4].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if possible. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring just before active growth commences[78], or in autumn[1]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of mature wood of the current seasons growth, 5 - 10 cm long, October in a cold frame. Roots quickly. High percentage[78].

nwatta Landscape Uses:Border, Container, Erosion control, Ground cover, Massing, Specimen. A very easily grown plant, it succeeds in almost any soil[200] but prefers those that are on the richer side[17]. It grows well in heavy clay soils. Plants are very shade tolerant but they do not flower so well in deep shade[11, 28, 31]. It grows well under deciduous trees[187], and in such a position it can succeed in dry soils[190]. Established plants are drought tolerant[190]. A very ornamental[1] and polymorphic plant[200], there are some named forms selected for their ornamental value[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. This species rarely if ever sets seed in Britain[4]. It spreads rapidly by long trailing and rooting stems once it is established and will swamp out smaller plants[4]. Special Features:Attractive foliage, Not North American native, Naturalizing, Attractive flowers or blooms.

### 5.2.909 Nabalus serpentarius

Lion's Foot  
4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkuc  
pcimhimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Nabalus serpentarius is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta RepellentThe juice of the plant repels snakes[207].

dwatta AntidoteThe plant is said to be an antidote for snake bites[207].

propta Seed - surface sow in a greenhouse in spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in shade or semi-shade in a moist but well-drained humus-rich neutral to acid soil[200].

### 5.2.910 Coreopsis auriculata

Tickseed, Lobed tickseed, Mouse-eared Coreopsis, Eared Coreopsis

4 tlin 8 cyuc 0 kcaak 3 tcan 0 dwat 1.5 m hkuc  
htut cyutli hgatyuctcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Coreopsis auriculata is a PERENNIAL growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils

and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta DyeLandscape Uses: Border, Container, Massing.An orange to red/orange dye is obtained from the flowers and stems[168]. Established plants are drought resistant[1]. Special Features: Attracts birds, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers. The shorter cultivar *Coreopsis auriculata* ‘Nana’ (Dwarf Mouse-ear Tickseed, Lobed Tickseed ‘Nana’) is a good low ground cover performing best with consistent moisture.

dwatta None known

propta Seed - sow March in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer[111]. The seed can also be sown in an outdoor seedbed in mid spring. Once they are more than 15cm tall, plant the seedlings out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Cuttings of young basal shoots, May/June in a frame[200]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1]. Prefers a fertile well-drained moisture retentive medium soil[111, 200]. Requires a sunny position[111, 200]. Established plants are drought resistant[1]. Plants are apt to die overwinter if they are grown on clay soils[111]. A good bee plant[200]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2]. The shorter cultivar *Coreopsis auriculata* ‘Nana’ (Dwarf Mouse-ear Tickseed, Lobed Tickseed ‘Nana’) is useful for borders, edging, rock gardens and ground cover performing best with consistent moisture. It spreads by stolons but is not invasive. Height: 15-30 cm (6-12 in) Spread: 15-30 cm (6-12 in).

## 5.2.911 Aconitum hemsleyanum

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkc hnmihmtt cyutli tcup hwicli hrasjltunykfrp hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Aconitum hemsleyanum is a PERENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta A widely used herbal remedy in China, where it is cultivated for its root[4]. This is harvested in the autumn as the plant dies down and is then dried before being used. The root is anaesthetic, analgesic, anti-inflammatory, antirheumatic, cardiotoxic, stimulant and vasodilator[4]. Use with caution, the plant is very poisonous and should not be used internally[218].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. Closely related to *A. fischeri* and considered to be part of that species by some botanists[1].

## 5.2.912 Dipsacus sativus

Fuller’s Teasel, Indian teasel

4 tlin 8 cyuc 0 kcaak 2 tcan 2 dwat 1.8 m hkc htut cyutli tcup hwicli hrasjltunykfrp hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta *Dipsacus sativus* is a BIENNIAL/PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Brush DyeThe dried flower heads are used for carding wool and as a clothes brush for raising the nap on woollen cloth[7, 46, 74, 169]. They are harvested with about 20cm of stem as soon as the flowers wither and are dried for later use[4]. A blue dye is obtained from the dried plant, an indigo substitute[74]. It is water soluble[74]. The colour is yellow when mixed with alum[148].

dwatta Cancer Diaphoretic Diuretic Homeopathy Stomachic WartsThe root is diaphoretic, diuretic and stomachic[7]. An infusion is said to strengthen the stomach, create an appetite, remove obstructions of the liver and treat jaundice[4]. The root is harvested in early autumn and dried for later use[7]. The plant has a folk history of use in the treatment of cancer, an ointment made from the roots is used to treat warts, wens and whitlows[4, 218]. A homeopathic remedy is made from the flowering plant[7]. It is used in the treatment of skin diseases[7].

propta Seed - best sown in early spring in situ[115]. The seed can also be sown from February to May or from August to October. All but the earlier sowings can be made outdoors.

nwatta Succeeds in most soils[1] but prefers clay[17]. Prefers a deep rich soil[169]. Requires a sunny position[169]. A good butterfly plant[24]. Fuller’s teasel is occasionally cultivated for its seed head, which is used for carding cloth[1, 2, 46]. The flowering heads are also much prized by flower arrangers because they keep their colour almost indefinitely when dried[7].

## 5.2.913 Senecio jacobaea

Ragwort, Stinking willie

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkc hnmihmtt cyutli tcup hwicli hrasjltunykfrp hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta *Senecio jacobaea* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy)

can be planted to control banks from erosion[226]. The bark and the strobils are a source of tannin[82]. A dark dye is obtained from the bark[226]. The colour can range from orange through red to brown[257]. Wood - soft, straight-grained, very durable in water[82]. It is of no commercial value, though it is used locally as a fuel[229].

dwatta Anodyne Astringent Emetic Febrifuge Haemostatic Stomachic TonicThe bark is astringent, emetic, haemostatic, stomachic and tonic[172]. The bark also contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226]. The outer bark is astringent and is applied as a poultice to bleeding wounds, it also reduces swellings[226].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Landscape Uses: Erosion control. Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. A fast-growing but short-lived tree[229]. There is some confusion over the correct name of this tree with one authority citing the European species *A. incana* as the correct name[60]. Another report says that this species is closely related to *A. incana*, but distinct[229]. Some modern works treat it as a subspecies (*Alnus incana tenuifolia*). This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Wetlands plant, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.1.21 Cytisus scoparius

Broom, Scotch broom, Common Broom  
tfo2n 5 tlin 8 cyuc 1 kcaak 4 tcan 3 dwat 2.4 m hkc hnmihmtt cyutli hgatkyuctcup hwicli hyishrasjltunyk hpa7tli frusflatprikliwis hpa7tmwatli dyatxre7t hjonli

drutta *Cytisus scoparius* is a deciduous Shrub growing to 2.4 m (7ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from August to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FlowersEdible Uses: Coffee CondimentThe flower buds are pickled and used as a substitute for capers[4, 46, 183, 244]. They can also be added to salads[183]. Some caution is advised, see the notes above on toxicity. The tender green tops of the plant have been used like hops to give a bitter flavour to beer and to render it more intoxicating[4, 183]. The roasted seed is a coffee substitute[2, 4, 115, 183].

tcanta Basketry Broom Dye Essential Fibre Paper Repellent Soil stabilization Tannin WoodAn excellent fibre is obtained from the bark, it is used in the manufacture of paper, cloth and nets[4, 100, 115]. It is not as strong as the fibre from the Spanish broom (*Spartium junceum*)[4]. The fibre is obtained from the root according to other reports[13, 46]. The bark fibre is used to make paper, it is 2 - 9mm long[189]. The branches are harvested in late summer or autumn, the leaves removed and the stems steamed until the fibres can be stripped. The fibres are cooked for 3 hours in lye then put in a ball mill for 3 hours. The paper is pale tan in colour[189]. The bark is a good source of tannin[4]. A yellow and a brown dye are obtained from the bark[46]. A yellow dye is obtained from the flowering stem[169]. A green dye is obtained from the leaves and young tops[4]. The branches are used to make baskets, brushes, brooms and besoms[4, 6, 13, 46, 55, 115]. They are also sometimes used for thatching roofs and as substitutes for reeds in making fences or screens[4]. An essential oil from the flowers is used in perfumery[57]. Growing well on dry banks and on steep slopes, it is an effective sand binder and soil stabiliser[4, 11, 46]. Broom is one of the first plant to colonize sand dunes by the coast[4]. The plant attracts insects away from nearby plants[14]. The var. *prostratus* (= *C. scoparius maritimus*)[208] makes a good fast growing ground cover plant to 30cm tall, though it needs weeding in its first year[197]. The cultivar ‘Andreasus Prostratus’ can also be used[208]. Wood - very hard, beautifully veined[4]. The plant seldom reaches sufficient size for its wood to be of much value, but larger specimens are valued by cabinet makers and for veneer[4].

dwatta Antiarrhythmic Antirheumatic Cardiotonic Cathartic Diuretic Emetic VasoconstrictorBroom is a bitter narcotic herb that depresses the respiration and regulates heart action[238]. It acts upon the electrical conductivity of the heart, slowing and regulating the transmission of the impulses[254]. The young herbaceous tips of flowering shoots are cardiotoxic, cathartic, diuretic, emetic and vasoconstrictor[4, 13, 21, 46, 165]. The seeds can also be used[4]. The plant is used internally in the treatment of heart complaints, and is especially used in conjunction with *Convallaria majalis*[238]. The plant is also strongly diuretic, stimulating urine production and thus countering fluid retention[254]. Since broom causes the muscles of the uterus to contract, it has been used to prevent blood loss after childbirth[254]. Use this herb with caution since large doses are likely to upset the stomach[4, 21]. The composition of active ingredients in the plant is very changeable, this makes it rather unreliable medicinally and it is therefore rarely used[9]. This herb should not be prescribed to pregnant women or patients with high blood pressure[238]. Any treatment with this plant should only be carried out under expert supervision[9]. See also the notes above on toxicity. The young herbaceous tips of flowering shoots are harvested in spring, generally in May[4]. They can be used fresh or dried[4, 238]. They should not be stored for more than 12 months since the medicinally active ingredients break down[238].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[80]. Pre-soak stored seed for 24 hours in warm water then cold stratify for 1 month and sow in a cold frame[80]. The seed usually germinates in 4 weeks at 20°C[98, 113]. Seedlings should be potted up as soon as possible since plants quickly become intolerant of root disturbance[186]. Plant them out into their permanent positions in late summer if they have made sufficient growth, otherwise in late spring of the following year[K]. The seed has a long viability[186]. Seed can also be sown in situ as soon as it is ripe in the late summer and autumn[4]. Cuttings of half-ripe wood, 4 - 7 cm with a heel, August in a frame[11]. Produces roots in the spring[11]. Pot up as soon as possible[11]. Cuttings of mature wood, October/November in a frame. Layering.

nwatta Agroforestry Services: Nitrogen Management; Coppice Minor Global CropLandscape Uses:Border, Container, Foundation, Massing, Specimen. Succeeds in most soils, preferring a fairly good but not rich soil[11]. Prefers a poor well-drained soil[14]. Succeeds in slightly acid, neutral and limy soils but dislikes shallow soils over chalk[200]. Plants are strongly calcifuge according to other reports and intolerant of a pH much above 6.5[17, 186]. Prefers a sunny position but tolerates some shade[11, 14, 17]. Plants succeed in exposed conditions, and are very tolerant of maritime exposure[4, K]. Plants have a deep root system, they are

situ[200]. The seed can also be sown in a cold frame in the autumn. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring[200]. Division just before new growth begins in spring[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings, September in a cold frame[111].

nwatta Prefers a sunny position in a well-drained neutral to alkaline soil[200]. Succeeds on the tops of walls and on dry banks[200]. Similar to *O. spinosa*, but this species is rhizomatous[200]. It can spread rapidly when well sited[1] and has become an obnoxious weed in some areas[245]. Mature roots are very tough and the plant gained its common name of 'Rest Harrow' because ploughs and harrows would be unable to break through it (in the days before heavy machinery was used on the land!). The whole plant emits a delicious resinous odour when bruised[245]. A food plant for the common blue butterfly[200]. Dislikes root disturbance[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.19 Wisteria sinensis

Chinese Wisteria  
tfo2n 5 tlin 9 cyuc 1 kcak 3 tcan 1 dwat 25 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta Wisteria sinensis is a deciduous Climber growing to 25 m (82ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers SeedEdible Uses: TeaSeed - cooked[105, 177, 183]. Some caution is advised, see notes on toxicity at the top of the page. Flowers - cooked. They are thoroughly washed and then boiled or made into fritters[105, 177, 179, 183]. The flowers are also cured in sugar then mixed with flour and made into a famous local delicacy called 'Teng Lu'[249]. The leaves contain allantoin acid[218]. They are used as a tea substitute[218]. The young leaves have also been eaten[249].

tcanta PaperA fibre from the stems can be used to make paper, the fibre is about 1.3 - 3.7mm long[189]. Stems are harvested in the summer, the leaves removed and the stems steamed until the fibre can be stripped. The fibres are cooked for 2 hours with lye and then put in a ball mill for 3 hours. The paper is a buff colour[189]. Nitrogen Fixer.

dwatta Cardiac DiureticThe seed is diuretic[178, 218]. It is used in the treatment of heart ailments[178, 218]. One report says that the stems and flowers are also used in Chinese medicine, but gives no more information[249].

propta The seed does not exhibit any dormancy habits. It can be sown as soon as it is ripe in a cold frame and should germinate in the spring. Pre-soaked seed for 24 hours in warm water and then sow in a greenhouse in early spring. The seed can also be sown in an outdoor seedbed in late spring[126]. Germination should take place in the first spring, though it can sometimes be delayed for another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Plants are very slow from seed and can take up to 20 years to come into flower[200]. Basal cuttings of side-shoots in early to mid summer in a frame[200]. Take the cuttings as soon as the new growth has hardened sufficiently, each cutting should have 2 - 3 leaves[249]. It can also help to remove a shallow slice of bark from the bottom 15mm of the cutting to expose extra cambium, since this will encourage more callusing and better rooting[249]. When kept in a mist frame with a bottom heat of 27 - 30°C, they will root within 4 weeks and produce well-established plants by the autumn[249]. Layering in spring. Simply lay any convenient

long shoot along the ground and cover it with a shallow layer of soil. The shoot will readily produce roots at intervals along the stem. When these are well formed, the shoot can be divided up into a number of plants. These should be potted up and kept in a lightly shaded position in a greenhouse until well established and can then be planted out as required. Division of suckers in the winter[249]. If growing named varieties, it is of course necessary to ensure they are growing on their own roots if the suckers are to be true to type[249].

nwatta Landscape Uses:Arbor, Espalier, Pollard, Standard. Prefers a good loamy soil in a sunny south or south-west facing position, sheltered from cold winds and from early morning sun on frosty mornings[11, 200]. Succeeds in partial shade. Plants can become chlorotic on alkaline soils[200]. A soil that is too rich results in excessive foliage at the expense of flowering[200]. Hardy to about -15°C[184, 200]. Plants can take a few years to settle down after planting out[219]. Too much shade or too rich a soil are normally the culprits, some form of root restriction can be beneficial[219]. There are several named forms selected for their ornamental value[188]. Sparrows and other birds frequently eat the young buds of this plant and this is the commonest cause of poor flowering on established plants[184]. Plants sometimes have a second season of flowering in August[219]. The plants flower mainly on short spurs so, if removing unwanted side-branches, it is best to cut them back to 2 - 3 leaves rather than removing them completely since this will encourage the formation of flowering spurs[249]. Any drastic pruning is best carried out in the spring, immediately after flowering[249]. Plants are very tolerant of even the most drastic pruning and will re-grow even if cut right back to the base[249]. A climbing plant supporting itself by twining around other plants, the shoots twine in an anticlockwise direction[182]. Very tolerant of pruning, plants can regenerate from old wood[202]. Plants in this genus are notably susceptible to honey fungus[200]. Closely related to *W. floribunda*[126]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plants also form a symbiotic relationship with a mycorrhizal fungus which makes more water, phosphorus and other minerals available to the plants[249]. Special Features:Not North American native, Invasive, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Fragrant flowers, Blooms are very showy.

### 6.1.20 Alnus tenuifolia

Mountain Alder, Thinleaf alder  
tfo2n 5 tlin 7 cyuc 1 kcak 0 tcan 2 dwat 9 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hysjlutnyikfrip hpa7tli flat-  
prikliwis hpa7tmwatli hjonli

drutta Alnus tenuifolia is a deciduous Tree growing to 9 m (29ft 6in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower in March, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: FlowersEdible Uses: Catkins - raw or cooked. A bitter taste[172].

tcanta Pioneer Soil stabilization Tannin WoodThis is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc[226]. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. The tree has an extensive root system and

and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta DyeA good green dye is obtained from the leaves, though it is not very permanent[4, 115]. A yellow dye is obtained from the flowers when alum is used as a mordant[4, 115, 168]. Brown and orange can also be obtained[168].

dwatta Antirheumatic Astringent Diaphoretic Diuretic Emmenagogue Expectorant HomeopathyThe plant is astringent, diaphoretic, diuretic, emmenagogue and expectorant[9, 21]. The plant is harvested as it comes into flower and is dried for later use[9]. Use with caution[21], when applied internally it can cause severe damage to the liver[9]. See also the notes above on toxicity. An emollient poultice is made from the leaves[4]. The juice of the plant is cooling and astringent, it is used as a wash in burns, sores, cancerous ulcers and eye inflammations[4]. It makes a good gargle for ulcerated mouths and throats and is also said to take away the pain of a bee sting[4]. Caution is advised here since the plant is poisonous and some people develop a rash from merely touching this plant[K]. A decoction of the root is said to be good for treating internal bruises and wounds[4]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of dysmenorrhoea and other female complaints, internal haemorrhages and other internal disorders[9].

propta A noxious weed, it doesn't need any help in spreading itself about.

nwatta Succeeding on all but the poorest soils, this plant is a declared noxious weed in Britain spreading freely by seed. It should not be cultivated other than in controlled conditions for scientific research. Ragwort can be eradicated by pulling it up just before it comes into flower, or by cutting it down as the flowers begin to open (this latter may need to be repeated about six weeks later)[4]. Ragwort is a good food plant for the caterpillars of many butterfly and moth species, and is one of only two species that provide food for cinnabar moth caterpillars.

### 5.2.914 Petasites hybridus

Butterbur, Pestilence wort  
4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 1 m hkuc  
pcimhmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli  
flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Petasites hybridus is a PERENNIAL growing to 1 m (3ft 3in) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf from April to December, in flower from March to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known  
tcanta None known

dwatta Analgesic Antispasmodic Appetizer Cardiotonic Diaphoretic Diuretic Homeopathy UrinaryButterbur is widely considered to be an effective cough remedy and recent experiments have shown it to have remarkable antispasmodic and pain-relieving properties[244]. It acts specifically on the bile ducts, stomach and duodenum[254]. The plant contains pyrrolizidine alkaloids, in isolation these are toxic to the liver[254]. The root and the leaves are analgesic, antispasmodic, cardiotonic, diaphoretic and diuretic[4, 9]. A decoction is taken as a remedy for various respiratory problems such as asthma, colds, bronchitis and whooping cough and also other complaints such as fevers and urinary complaints[4, 254]. It is also very effective in the treatment of gastrointestinal complaints and biliary dyskinesia[244, 254]. Externally it can be used as a poultice to speed the healing of wounds and skin eruptions[254]. The leaves are harvested in early summer, the root in late summer to autumn. Both can be dried for later use[9]. Because the plant contains potentially toxic alkaloids its internal use cannot be recommended[254]. A homeopathic remedy is made from the

roots[4]. It is used in the treatment of severe and obstinate neuralgia[4].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Requires a moist shady position[187]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Its roots are very difficult to eradicate[200]. It is best to only grow the male form in the garden to prevent unwanted seedlings popping up all over the place[200]. The growth is so dense and vigorous, with large leaves that can be 75cm or more across, that virtually no other plant is able to grow amongst this species[4]. Plants are a useful early nectar source for bees[200]. Dioecious, male and female plants must be grown if seed is required.

### 5.2.915 Dipsacus fullonum

Teasel, Fuller's teasel  
4 tlin 8 cyuc 0 kcak 2 tcan 2 dwat 1.8 m hkuc  
htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis  
hpa7tmwatli fyfxre7t hjonli

drutta Dipsacus fullonum is a BIENNIAL/PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta DyeA blue dye obtained from the dried plant is an indigo substitute[74]. It is water soluble[74]. A yellow is obtained when the plant is mixed with alum[148]. Teasels are also occasionally grown as ornamental plants, and the dried heads are used in floristry. The seeds are an important winter food resource for some birds, notably the European goldfinch. Teasels are often grown in gardens and encouraged on some nature reserves to attract them. A rich source of pollen and nectar for bees and other insects. Formerly widely used in textile processing, providing a natural comb for cleaning, aligning and raising the nap on fabrics, particularly wool.

dwatta Cancer Diaphoretic Diuretic Homeopathy Skin Stomachic WartsTeasel is little used in modern herbalism, and its therapeutic effects are disputed[254]. Traditionally it has been used to treat conditions such as warts, fistulae (abnormal passages opening through the skin) and cancerous sores[254]. The root is diaphoretic, diuretic and stomachic[7]. An infusion is said to strengthen the stomach, create an appetite, remove obstructions of the liver and treat jaundice[4, 254]. The root is harvested in early autumn and dried for later use[7]. An infusion of the leaves has been used as a wash to treat acne[257]. The plant has a folk history of use in the treatment of cancer, an ointment made from the roots is used to treat warts, wens and whitlows[4, 218]. A homeopathic remedy is made from the flowering plant[7]. It is used in the treatment of skin diseases[7].

propta Seed - best sown in early spring in situ[115]. The seed can also be sown from February to May or from August to October. All but the earlier sowings can be made outdoors.

nwatta Succeeds in most soils[1] but prefers clay[17]. Prefers a deep rich soil[169]. Requires a sunny position[169]. A good butterfly plant[24]. This is the true wild species of teasel, its bracts are too flexible to be used for combing cloth[17]. The flowering heads are much prized by flower

arrangers because they keep their colour almost indefinitely when dried[7].

### 5.2.916 Lobelia spicata

Pale Spike, Palespike lobelia

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lobelia spicata is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta MiscellanyNone known

dwatta Emetic MiscellanyA tea made from the leaves is emetic[222]. A wash made from the stalks was used to treat neck and jaw sores[222]. A tea made from the root was used in the treatment of trembling limbs - it was applied to scratches made in the limb[222].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200]. Basal cuttings in spring[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Layering in moist sand, it forms roots at the nodes[200].

nwatta Requires a moist soil, succeeding in full sun or partial shade[111, 187, 200].

### 5.2.917 Silphium trifoliatum

Whorled rosinweed

4 tin 6 cyuc 0 kcak 2 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Silphium trifoliatum is a PERENNIAL growing to 1.8 m (6ft) by 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Dave Jacke in his book Edible Forest Gardens has noted that this plant is edible although we have been unable to find any confirmation. Other Silphium species are edible for example Silphium integrifolium produces an protein-oil staple Crop and Silphium laciniatum resin is used as a chewing gum to sweeten the breath[4, 61, 105, 257].

tcanta Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. Garden Ornamental. More manageable than most perennial sunflowers as it spreads slowly, and it is not known to be allelopathic. Adapts well to prairies, wild-flower/native plant gardens, naturalized areas, meadows or moist, open woodland areas. Attracts birds and butterflies

dwatta None known

propta Seed. Plants may be slow to establish in the garden, particularly when grown from seed. Plants often self seed in optimum growing conditions. Division.

nwatta A tall perennial forb for full to partial shade. Leaves are attached to the stem in a 'whorled' formation. Sun Exposure: Full, Partial. Soil Moisture: Medium, Medium-Dry. Drought-tolerant; suitable for xeriscaping. Bloom Time: July to September. Bloom Color: Yellow. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available.

The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

### 5.2.918 Silphium terebinthinaceum

Prairie Dockm, Prairie rosinweed, Lucy Braun's rosinweed

4 tin 8 cyuc 0 kcak 0 tcan 2 dwat 1.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Silphium terebinthinaceum is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: GumNone known

tcanta GumA gum or resin that is obtained from the stem can be chewed to cleanse the mouth and teeth[207].

dwatta Diuretic Emetic Expectorant Tonic VermifugeA tea made from the roots is vermifuge and a tonic for general debility[4, 61, 222]. A tea made from the leaves is emetic, it has been used in the treatment of coughs, lung ailments and asthma[4, 61, 222]. A resin in the plant is diuretic[4, 61, 222].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Division in spring[188]. This is very difficult due to the deep and extensive root system.

nwatta Succeeds in any ordinary garden soil[1]. Prefers a deep moisture retentive moderately fertile soil that is not too nitrogen rich, in sun or dappled shade[200]. Succeeds in the wild or woodland garden[200]. Plants have a deep and extensive root system which makes transplanting difficult[200].

### 5.2.919 Aster novi

Michaelmas Daisy, New York Aster

4 tin 8 cyuc 0 kcak 2 tcan 0 dwat 1.2 m hkuc

hmimhtut cyutli tcup hwicli vyhshrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Aster novi-belgii is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 2. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Landscape Uses: Woodland Garded ;Border, Rock garden, Seashore. A forest garden plant that can be grown in dappled shade. Attracts wildlife.

dwatta None known

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200], but it also succeeds in partial shade[233]. Prefers a rich soil[1], but tolerates poor

North American native, Attracts butterflies, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2].

### 6.1.16 Ononis spinosa

Spiny Rest Harrow

tfo2n 5 tin 9 cyuc 2 kcak 3 tcan 2 dwat 0.6 m hkuc

htut cyutli kyuctcup hwicli hyshrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Ononis spinosa is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Young shoots - cooked[2, 105]. Used as a potherb[183]. Roots - chewed for their liquorice-like flavour[183]. Flowers - raw. They are used as a decoration on salads[7].

tcanta Nitrogen Fixer

dwatta Antirheumatic Antitussive Aperient Diuretic LithontripicThe roots, leaves and flowers are antitussive, aperient, diuretic and lithontripic[7, 9, 13, 21, 46]. The root contains a fixed oil that is anti-diuretic and an essential oil that is diuretic. If the diuretic action is required then the root should be infused and not decocted or the essential oil will be evaporated[254]. An infusion is used in the treatment of dropsy, inflammation of the bladder and kidneys, rheumatism and chronic skin disorders[9]. The roots are used occasionally, they are harvested in the autumn, cut into slices and carefully dried for later use[9]. The young shoots are more commonly used, either fresh or dried[9]. They can be harvested throughout the summer[9]. A cough mixture is made from the bark[13].

propta Scarify or pre-soak the seed for 24 hours in warm water and sow the seed in the middle of spring in situ[200]. The seed can also be sown in a cold frame in the autumn. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring[200]. Division just before new growth begins in spring[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings, September in a cold frame[111].

nwatta Prefers a sunny position in a well-drained neutral to alkaline soil[200]. Succeeds in poor soils, the plant often becoming spiny in such a situation[17]. Similar to *O. repens* but this species is not rhizomatous[200]. Mature roots are very tough and the plant gained its common name of 'Rest Harrow' because ploughs and harrows would be unable to break through it (in the days before heavy machinery was used on the land!). The whole plant is pleasantly scented when bruised[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.17 Lathyrus linifolius montanus

Bitter Vetch

tfo2n 5 tin 9 cyuc 2 kcak 3 tcan 0 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lathyrus linifolius montanus is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root SeedEdible Uses: Seed - cooked[2, 177]. Used as a vegetable, they are served in the same manner as sweet chestnuts[2]. Some caution is advised in the use of this seed, see the notes above on toxicity. Root - cooked[5, 61, 105]. Boiled or roasted, they have a sweet flavour and are very nutritious[2, 115].

tcanta Nitrogen fixer.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division in spring. It may not transplant well so care should be taken[200].

nwatta An easily grown plant, succeeding in any moderately good garden soil but preferring a position in full sun[200]. Formerly cultivated for its edible seed[2]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous.

### 6.1.18 Ononis repens

Rest Harrow, Common restharrow

tfo2n 5 tin 9 cyuc 2 kcak 0 tcan 1 dwat 0.6 m hkuc

htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ononis repens is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Drink-Root - raw or cooked. A liquorice substitute[5, 66]. Soaked in cold water it makes a refreshing cold drink[66]. The young shoots were at one time much used as a vegetable, being boiled, pickled or eaten in salads[4].

tcanta None known

dwatta LithontripicThe whole herb has been used in the treatment of bladder stones and to subdue delirium[4].

propta Scarify or pre-soak the seed for 24 hours in warm water and sow the seed in the middle of spring in



a symbiotic relationship with a mycorrhizal fungus which makes more water, phosphorus and other minerals available to the plants[249]. Special Features:Not North American native, Invasive, Naturalizing, All or parts of this plant are poisonous, Fragrant flowers, Blooms are very showy. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 6.1.14 Indigofera tinctoria

Indigo, True Indigo, dye indigo  
tfo2n 5 tlin 12 cyuc 2 kcaak 4 tcan 2 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwis  
hpa7tmwatli hjonli

drutta Indigofera tinctoria is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: ColouringThe deep blue dye obtained from the leaves is sometimes used to counteract the slightly yellow colour of icing sugar[301].

tcanta Dye Green manure Insecticide Soil conditioner TeethAgroforestry Uses: The plant is sometimes grown as a cover crop and green manure[418 ]. Indigofera tinctoria is useful as a green manure, it is used in India, for example, in coffee plantations and as a cover crop preceding rice, maize, cotton and sugarcane[299 ]. In traditional rainfed rice cropping systems in the Philippines, this plant is a popular green manure, increasing rice yield whilst also reducing by 50% the need to supply expensive nitrogen fertilizer[299 ]. The residue remaining after indigo extraction is also applied to the land as manure[299 ]. Another reason to grow Indigofera tinctoria as a green manure is because it is a good nitrogen catch crop, reducing the amount of fertilizer NO3 leaching to the groundwater[299 ]. Other Uses: A deep blue dye is obtained from the leaves[46 , 299 , 301 ]. The leaves and twigs do not actually contain indigo but colourless precursors that must be extracted and then processed in order to produce the indigo dye[299 ]. The harvested leafy branches are placed in a tank containing water to which some lime has been added, and are weighted down with planks[303 ]. After some hours of fermentation, during which enzymic hydrolysis leads to the formation of indoxyl, the liquid is drained off and then stirred continuously for several hours to stimulate oxidation of the indoxyl[303 ]. Afterwards the solution is left to rest and the insoluble indigo settles to the bottom as a bluish sludge[303 ]. The water is drained and after the indigo has dried, it is cut into cubes or made into balls[303 ]. To dye textiles, indigo is reduced to a soluble form by a fermentation process under alkaline conditions. In traditional preparations of the dye, various reducing agents such as molasses are used, together with coconut-milk, bananas and the leaves of Psidium guajava[303 ]. The alkalinity is maintained by adding lime. After the textile has been dipped into solution it turns blue when exposed to the air[303 ]. The twigs are used as toothbrushes[299 ].

dwatta Antiasthmatic Antihemorroidal Epilepsy Febrifuge Kidney Mouthwash Skin Stings StomachicA leaf infusion (sometimes combined with honey or milk) is used to treat a range of disorders including epilepsy and nervous disorders; asthma and bronchitis; fever; complaints of the stomach, liver, kidney and spleen; and as a rabies prophylactic[299 ]. Applied externally, the leaves are made into an ointment for treating skin diseases, wounds, sores, ulcers and haemorrhoids[299 ]. A tincture of the seed is used in India to kill lice[299 ]. A root preparation is applied to relieve toothache, syphilis, gonorrhoea and kidney stones[299 ]. A watery root paste is applied topically in India to treat worm-infested wounds[299 ]. A root infusion is used there as an antidote against snakebites and to treat insect and scorpion stings[299 ].

propta Seed - pre-soak overnight in warm water and sow in a seedbed with partial shade. Germination takes about

4 days[299 ]. Semi-ripe cuttings of lateral shoots with a heel[200 ]. Root cuttings.

nwatta Agroforestry Services: Nitrogen Industrial Crop: Dye Management: Coppice Minor Global CropA plant of the tropics and subtropics, where it is found at elevations up to 1,600 metres. It grows best in areas where annual daytime temperatures are within the range 22 - 28°C, but can tolerate 7 - 32°C[418 ]. It prefers a mean annual rainfall in the range 1,300 - 1,700mm, but tolerates 640 - 3,000mm[418 ]. Requires a position in full sun, succeeding in any deep, well-drained and moderately retentive and fertile soil[200 ]. Prefers a pH in the range 6 - 7, tolerating 4.3 - 8.7[418 ]. Requires a position sheltered from hot winds[418 ]. Branches are harvested by cutting 10 - 20cm above ground level when the plants are 4 - 5 months old and have formed a closed stand, usually at the flowering stage[299 ]. The crop should be harvested promptly because heavy rains or flooding can destroy it in a few hours. In India harvested branches are tied into bundles of about 130 kg and transported to the dye factory. Up to 3 harvests are possible per year[299 ]. Dye yields can be 1.6 - 5.4 tonnes per hectare[418 ]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[755 ]. Flowering Time: Mid Spring. Bloom Color: Red-Orange or Pink. Spacing: 36-48 in. (90-120 cm).

## 6.1.15 Indigofera decora

Chinese indigo  
tfo2n 5 tlin 7 cyuc 2 kcaak 3 tcan 1 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasljut hpa7tli flatprikwlisslip  
hpa7tmwatli xre7t hjonli

drutta Indigofera decora is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[105, 177]. It can also be dried and ground into a powder then mixed with wheat flour or other cereals when making bread, cakes etc[179].

tcanta MiscellanyNitrogen Fixer.  
dwatta MiscellanyA broth made from the leafy shoots is used in the treatment of cough, dyspepsia, haemorrhage and poisoning[218].

propta Pre-soak the seed for 12 hours in warm water and sow February in a warm greenhouse. The germination can be variable. Prick out the seedlings when large enough to handle and overwinter the young plants in a greenhouse for the first winter, planting out in late spring or early summer after the last expected frosts[78]. Cuttings of half-ripe wood, 5 - 8cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Overwinter the young plants in a greenhouse for the first winter and plant out in late spring or early summer[11]. Root cuttings 3cm long in December. Good percentage[78]. Suckers. Remove them in the dormant season, preferably towards the end of winter, and plant out into their permanent positions.

nwatta Landscape Uses:Border, Foundation, Massing, Specimen. Requires a light or medium well-drained soil and a warm sunny position[11, 200, 260]. Succeeds on chalk[11]. Prefers growing in areas with warm summers[260]. Plants are hardy to about -10°C[260]. The top-growth is not very winter-hardy however, the stems are often cut back by cold weather but new shoots are produced in spring and these flower in late summer[182]. A very ornamental plant[1], it is closely related to *I. fortunei*[182]. The flowers, which are borne over a period of about 20 weeks, have a vanilla scent[245]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not

ones[233]. Plants are hardy to about -25°C[187]. A polymorphic species, there are many named varieties selected for their ornamental value[1]. Hybridizes freely with other members of this genus[200]. Plants need to be divided every few years, preferably in the spring, in order to keep the plant vigorous[187]. Most species in this genus seem to be immune to the predations of rabbits[233]. Attracts butterflies and moths, it is also a good bee plant providing nectar in autumn[30]. Special Features: Attracts birds, Naturalizing, Attracts butterflies, Suitable for cut flowers.

## 5.2.920 Nabalus albus

White Lettuce  
4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc  
pimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta Nabalus albus is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Antidote Diuretic GalactagogueThe powdered root is sprinkled on food to stimulate milk flow after childbirth[222]. A tea made from the roots is used as a wash for weakness[222]. A latex in the stems is diuretic, it is used in female diseases[222]. It is also taken internally in the treatment of snakebite[222]. A poultice of the leaves or roots is applied to snakebites, dog bites etc[222].

propta Seed - surface sow in a greenhouse in spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in shade or semi-shade in a moist but well-drained humus-rich neutral to acid soil[200].

## 5.2.921 Digitalis purpurea

Foxglove, Purple foxglove, Common Foxglove  
4 tlin 8 cyuc 0 kcaak 2 tcan 4 dwat 1.2 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasljutnyik hpa7tli flatprikkwis  
hpa7tmwatli xre7t hjonli

drutta Digitalis purpurea is a BIENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta Dye PreservativeAn infusion of the plant prolongs the life of cut flowers[54]. Root crops growing near this plant store better[54]. An apple-green dye is obtained from the flowers[168]. Cut flower. Cultivars have gained the Royal Horticultural Society's Award of Garden Merit.

dwatta Cardiac Diuretic Homeopathy Stimulant Tonic-The foxglove is a widely used herbal medicine with a recognised stimulatory effect upon the heart. It is also used in allopathic medicine in the treatment of heart complaints. It has a profound tonic effect upon a diseased heart, enabling the heart to beat more slowly, powerfully and regularly without requiring more oxygen[254]. At the same time it stimulates the flow of urine which lowers the volume of the blood and lessens the load on the heart[254]. The plant contains cardiac glycosides (including digoxin, digitoxin and lanatosides). Digitoxin rapidly strengthens the heartbeat but is excreted very slowly. Digoxin is therefore preferred as a long-term medication[254]. The leaves are cardiac, diuretic, stim-

ulant and tonic[4, 9, 21, 46, 171]. The leaves should only be harvested from plants in their second year of growth, picked when the flowering spike has grown and about two thirds of the flowers have opened[4]. Harvested at other times, there is less of the medically active alkaloid present[4]. The seed has also been used in the past[4]. The leaves also have a very beneficial effect on the kidneys, they are strongly diuretic and are used with benefit in the treatment of dropsy[4]. Great care should be exercised in the use of this plant, the therapeutic dose is very close to the lethal dose[222]. See also the notes above on toxicity. A homeopathic remedy is made from the leaves[9]. It is used in the treatment of cardiac disorders[9].

propta Seed - surface sow early spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 20°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can be sown outdoors in situ in the spring or autumn.

nwatta Landscape Uses:Border, Container, Massing, Specimen, Woodland garden. Easily grown in ordinary garden soil, especially if it is rich in organic matter[1]. Prefers a light dry soil in semi-shade[17] but succeeds in full sun if the soil is moist[200]. Grows well in acid soils[17]. Plants are hardy to about -25°C[187]. The foxglove is a very ornamental plant that is easily naturalized in the semi-shade of a woodland[1]. It contains glycosides and forms the basis of an important heart medicine for which it is cultivated commercially[4]. This species is commonly used by herbalists, whereas *D. lanata* is more commonly grown for supplying the pharmaceutical industry[238]. The plant contains much greater concentrations of the medically active ingredients when it is grown in a sunny position[115]. The flowers are very attractive to bees[4, 24]. Individual plants can produce up to 2 million seeds[4]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A good companion plant, it stimulates the growth of nearby plants, growing well with pine trees[18, 20, 54]. Special Features:Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

## 5.2.922 Anemone vitifolia

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc  
hmim cyutli tcup hwicli hrasljut hpa7tli flatprikkwis  
hpa7tmwatli fyfxre7t hjonli

drutta Anemone vitifolia is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta Insecticide TinderWoolly hairs from the achenes are used as a tinder[51, 272]. The root has insecticidal properties[218].

dwatta Anodyne Antirheumatic Dysentery Odontalgic VermifugeThe fresh root is antirheumatic and vermifuge[218]. The juice from the roots is taken internally in the treatment of dysentery[272]. It is also applied to aching teeth to relieve the pain and to the forehead to relieve headaches[218, 272]. A paste made from the roots is used externally to treat scabies[272]. The leaves are powdered and rubbed into the scalp to treat head lice[272].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 20°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first year in a lightly shaded place in a greenhouse. When large enough, plant them out into

their permanent positions in the spring. Division in March just before active growth commences. Root cuttings[200].

nwatta Succeeds in ordinary garden soil but prefers a rich sandy loam[1]. Requires a moist fertile soil in dappled shade[200]. Hardy to at least -20°c[187]. A very ornamental plant[1], it grows well in a woodland garden[200]. Plants can be far spreading by means of underground stolons[187]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.923 Phleum pratense

Timothy

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc hmimhtut cyulti tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Phleum pratense is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Biomass Fodder HairThe stems have been used to make hair brushes[257]. The plant can yield up to 15 tonnes of plant material per hectare and is a potential source of biomass[269].

dwatta CancerStored sterile timothy extracts arrested the growth of Sarcoma 45 and other tumour types[269].

propta Seed - sow spring in situ, only just covering the seed. If seed is in short supply, it can be surface sown in a pot in a cold frame. Ensure the pot does not dry out. When large enough to handle, prick the seedlings out into individual pots and plant out in the summer. Division in spring.

nwatta Fodder: Pasture Management: Hay Management: Standard Staple Crop: Balanced carbAn easily grown plant, it succeeds in a sunny position in any ordinary soil[200]. The plant is not drought tolerant[269]. Timothy grass is reported to tolerate an annual precipitation in the range of 35 to 176cm, an annual temperature range of 4.4 to 18.6°C, and a pH of 4.5 to 7.8[269]. The plant is best adapted to a cool, humid, temperate climate, growing best on rather heavy, deep and moist or even wet soils[269]. Yields are lower on light dry soils and sands[269]. The optimum temperature for growth is 18.3° - 21.6°C varying with day/night temperatures of 15°/10°C and 21°/15°C[269]. Timothy grass is a very variable species that is commonly grown as a hay grass. Several named forms have been developed[17, 269]. A short-lived perennial it is a common cause of hayfever[257]. An attractive addition to the wild flower meadow, the inflorescence dries and dyes well so is used in dried flower displays[200].

### 5.2.924 Geranium macrorrhizum

Bigroot Geranium

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat m hkuc pcmhmimhtut cyulti hgatkycuctup hwicli hrasljutnyik hpa7tli prikwlisslp hpa7tmwatli xre7t hjonli

drutta Geranium macrorrhizum is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Essential Pot-pourriThe very aromatic leaves have been used in the past as a source of geranium oil[187]. They are used in pot-pourri and perfumery[244]. A good dense ground cover plant[197, 200]. A very effective weed smotherer[187, 190]. Plants grow rampantly, rooting as they

spread[208]. They should be spaced about 60cm apart each way[208].

dwatta AphrodisiacAphrodisiac[61].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Very easy, virtually every bit of a divided plant, whether it has roots or not, will grow away and produce roots[190]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in dry or moist situations, in sun or light shade[187, 200]. Succeeds even in deep shade[208]. Tolerates a wide range of soil types, succeeding in any moderately fertile retentive soil[200]. Calcicole[50]. Established plants are drought resistant[190]. A very ornamental plant, there are many named varieties[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 5.2.925 Artemisia campestris

Field Southernwood

4 tin 8 cyuc 0 kcak 1 tcan 2 dwat 1.5 m hkuc hmimhtut cyulti hgatkycuctup hwicli hrasljut hpa7tli priklwis hpa7tmwatli hjonli

drutta Artemisia campestris is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta EssentialThe pulverized roots are aromatic and have been used as a perfume[257].

dwatta Abortifacient Anthelmintic Antiseptic Cholagogue Deobstruent Eczema Emmenagogue Ophthalmic Poulrice Stomachic TonicRelated to the southernwood, A. abrotanum, this species has similar though milder medicinal properties[4]. The herb is anthelmintic, antiseptic, cholagogue, deobstruent, emmenagogue, stomachic and tonic[4, 7, 165]. The main use of this herb is as an emmenagogue, it is also a good stimulant tonic and has some nervine principle[4]. The leaves have been chewed in order to treat stomach problems[257]. The plant was used by some native North American Indian tribes as an abortifacient to terminate difficult pregnancies[257]. Externally, the plant has been crushed and applied to rheumatic joints, eczema, bruises and sores[257]. A poultice of the crushed leaves has been applied to sore eyes[257]. An infusion of the roots has been used, especially on children, as a hair tonic and to treat scalp infections[257]. It has been taken internally to promote urination and bowel movements[257].

propta Seed - surface sow from late winter to early summer in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.926 Euphorbia corollata

Wild Spurge, Flowering spurge

4 tin 8 cyuc 0 kcak 2 tcan 2 dwat 1 m hkuc hmimhtut cyulti kyuctup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Euphorbia corollata is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH:

press the growth of the nitrogen bacteria by means of a root exudate[201]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 6.1.12 Lupinus luteus

Yellow Lupin, European yellow lupine

tfo2n 5 tin 9 cyuc 3 kcak 3 tcan 0 dwat 0.6 m hkuc htut cyulti tcup hwicli hyishrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Lupinus luteus is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[2, 46, 105]. Used as a protein-rich vegetable or savoury dish in any of the ways that cooked beans are used. The seed can also be ground into a powder and be mixed with cereal flours for making bread etc[183]. If the seed is bitter this is due to the presence of toxic alkaloids and the seed should not be eaten without treatment[183]. These alkaloids can usually be removed by soaking the seed in 2 or 3 changes of water. Low alkaloid varieties were developed prior to 1930 by Von Sengbusch[183]. The roasted seed is a coffee substitute[183].

tcanta Green manureA good green manure for poor soils, it is quite fast growing and fixes atmospheric nitrogen[50, 61, 87]. It is commonly grown as a soil improver in southern Europe[245].

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and sow in mid spring in situ[1, 200]. You may need to protect the seed from mice. Germination should take place within 2 weeks. The seed can also be sown in situ as late as early summer as a green manure crop.

nwatta An easily grown plant, succeeding in any moderately good soil in a sunny position[1, 200]. Succeeds in poor soils[46]. Requires an acid to neutral soil[200]. Cultivated for its edible seed in Italy[2], there are a number of varieties with sweet tasting seeds[183]. The flowers have a delicious vanilla-like perfume, the cultivar 'Romulus' has been especially mentioned[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. When removing plant remains at the end of the growing season, it is best to only remove the aerial parts of the plant, leaving the roots in the ground to decay and release their nitrogen.

### 6.1.13 Wisteria floribunda

Japanese Wisteria

tfo2n 5 tin 9 cyuc 2 kcak 2 tcan 0 dwat 8 m hkuc htut cyulti tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Wisteria floribunda is a deciduous Climber growing to 8 m (26ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from September to

October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves SeedEdible Uses: TeaSeed - cooked[105, 177, 183]. When baked in a fire they have much the same flavour as chestnuts[249]. Some caution is advised, see the notes on toxicity at the top of the page. Young leaves - cooked[105, 177, 183]. The tender young leaves are sometimes eaten and are also used as a tea substitute[249]. Flowers - cooked[105, 177, 183]. Used as a food in parts of China[249].

tcanta FibreThe bark is used for making ropes and sandals[249]. The branches can be used as cables and also for making bridges, for which purpose it is said to be very durable[249].

dwatta None known

propta The seed does not exhibit any dormancy habits. It can be sown as soon as it is ripe in a cold frame and should germinate in the spring. Pre-soak stored seed for 24 hours in warm water and then sow in a greenhouse in early spring. The seed can also be sown in an outdoor seedbed in late spring[126]. Germination should take place in the first spring, though it can sometimes be delayed for another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Plants are very slow from seed and can take up to 20 years to come into flower[200]. Basal cuttings of side-shoots in early to mid summer in a frame[200]. Take the cuttings as soon as the new growth has hardened sufficiently, each cutting should have 2 - 3 leaves[249]. It can also help to remove a shallow slice of bark from the bottom 15mm of the cutting to expose extra cambium, since this will encourage more callusing and better rooting[249]. When kept in a mist frame with a bottom heat of 27 - 30°c, they will root within 4 weeks and produce well-established plants by the autumn[249]. Layering in spring. Simply lay any convenient long shoot along the ground and cover it with a shallow layer of soil. The shoot will readily produce roots at intervals along the stem. When these are well formed, the shoot can be divided up into a number of plants. These should be potted up and kept in a lightly shaded position in a greenhouse until well established and can then be planted out as required.

nwatta Landscape Uses:Arbor, Espalier, Pollard. Prefers a good loamy soil in a sunny south or south-west facing position, sheltered from cold winds and from early morning sun on frosty mornings[11, 200]. Plants can become chlorotic on alkaline soils[200]. A soil that is too rich results in excessive foliage at the expense of flowering[200]. Although they are winter hardy to about -20°c[200], when growing in areas with cool summers the plants require the extra summer warmth of a sunny wall if they are to do well[184]. Plants can take a few years to settle down after planting out[219]. Too much shade or too rich a soil are normally the culprits, some form of root restriction can be beneficial[219]. A vigorous climbing plant, supporting itself by twining around shrubs and trees, though it also succeeds as a free-standing shrub, growing to about 2 metres in height. The shoots twine in a clock-wise direction[182]. This species is closely related to *W. sinensis*[50, 126]. Often grown as an ornamental plant, there are many named varieties[182, 200]. The flowers have a strong perfume which can be sweet or musty according to the variety being grown[249]. The plants flower mainly on short spurs so, if removing unwanted side-branches, it is best to cut them back to 2 - 3 leaves rather than removing them completely since this will encourage the formation of flowering spurs[249]. Any drastic pruning is best carried out in the spring, immediately after flowering[249]. Plants are very tolerant of even the most drastic pruning and will re-grow even if cut right back to the base[249]. Plants are self-fertile and usually produce good crops of seeds in cultivation, there are several cultivars such as 'Geisha' and 'Royal Purple' that are particularly good at this[249]. Plants in this genus are notably susceptible to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plants also form

tussive, cholagogue, demulcent, emollient, expectorant and laxative[61, 176, 218, 238]. It is used internally in the treatment of Addison's disease, asthma, coughs and peptic ulcers[238]. Externally, it is used to treat acne, boils and sore throats[238]. It is included in almost all Chinese herbal formulae, where it is said to harmonize and direct the effects of the various ingredients[238]. It precipitates many compounds and is therefore considered to be unsuitable for use with some herbs such as *Daphne genkwa*, *Euphorbia pekinensis* and *Corydalis solida*[238]. It increases the toxicity of some compounds such as ephedrine, salicylates, adrenaline and cortisone[238]. It should not be prescribed for pregnant women or for people with high blood pressure, kidney disease or anyone taking digoxin-based medications[238]. Excessive doses cause water retention and high blood pressure[238]. It can cause impotence in some people[238]. The roots are harvested in early autumn, preferably from plants 3- 4 years old, and is dried for later use[238]. The flowers are alterative and expectorant[218].

propta Pre-soak the seed for 24 hours in warm water and then sow spring or autumn in a greenhouse[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in a greenhouse. Plant out in late spring or early summer when in active growth. Plants are rather slow to grow from seed[238]. Division of the root in spring or autumn. Each division must have at least one growth bud. Autumn divisions can either be replanted immediately or stored in clamps until the spring and then be planted out[200]. It is best to pt up the smaller divisions and grow them on in a cold frame until they are established before planting them out in the spring or summer.

nwatta Requires a deep well cultivated fertile moisture-retentive soil for good root production[200]. Prefers a sandy soil with abundant moisture[238]. Slightly alkaline conditions produce the best plants[238]. Plants are hardy to at least -15°c[238]. This species is widely cultivated in China as a medicinal plant. Unless seed is required, the plant is usually prevented from flowering so that it puts more energy into producing good quality roots[238]. A very deep-rooted plant, it can be difficult to eradicate once it is established[238]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. The plant is heat tolerant in zones 10 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 6.1.11 *Trifolium pratense*

Red Clover  
tfo2n 5 thin 9 cyuc 3 ckak 4 tcan 3 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hyishraslutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Trifolium pratense* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can

tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Condiment TeaLeaves and young flowering heads - raw or cooked[2, 55, 105, 183]. The young leaves are harvested before the plant comes into flower, and are used in salads, soups etc[9]. On their own they can be used as a vegetable, cooked like spinach[9].The leaves are best cooked[172]. They can be dried, powdered and sprinkled on foods such as boiled rice[183]. The leaves contain 81% water, 4% protein, 0.7% fat, 2.6% fibre and 2% ash[218]. The seed can be sprouted and used in salads. A crisp texture and more robust flavour than alfalfa (*Medicago sativa*)[183]. The seeds are reported as containing trypsin inhibitors[218]. These can interfere with certain enzymes that help in the digestion of proteins, but are normally destroyed if the seed is sprouted first. Flowers and seed pods - dried, ground into a powder and used as a flour[115]. The young flowers can also be eaten raw in salads[144, 172]. Root - cooked[172, 177]. A delicate sweet herb tea is made from the fresh or dried flowers[21, 55, 183]. The dried leaves impart a vanilla flavour to cakes etc[172].

tcanta Dye Green manure Miscellany Soil reclamationA yellow dye is obtained from the flowers[46, 61]. The plant makes a good green manure, it is useful for over-wintering, especially in a mixture with *Lolium perenne*[54]. Deep rooting, it produces a good bulk[87]. It is a host to 'clover rot' however, so should not be used too frequently[87]. It can be undersown with cereals though it may be too vigorous[87]. It is also grown with grass mixtures for land reclamation, it has good nitrogen fixing properties[200]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Alternative Antipsoriatic Antiscrophulatic Antispasmodic Aperient Cancer Detergent Diuretic Eczema Expectorant Miscellany Sedative Skin TonicRed clover is safe and effective herb with a long history of medicinal usage. It is commonly used to treat skin conditions, normally in combination with other purifying herbs such as *Arctium lappa* and *Rumex crispus*[254]. It is a folk remedy for cancer of the breast, a concentrated decoction being applied to the site of the tumour in order to encourage it to grow outwards and clear the body[254]. Flavonoids in the flowers and leaves are oestrogenic and may be of benefit in the treatment of menopausal complaints[254]. The flowering heads are alterative, antiscrofulous, antispasmodic, aperient, detergent, diuretic, expectorant, sedative and tonic[4, 21, 165, 218, 238]. It has also shown anticancer activity[172, 218], poultices of the herb have been used as local applications to cancerous growths[4]. Internally, the plant is used in the treatment of skin complaints (especially eczema and psoriasis), cancers of the breast, ovaries and lymphatic system, chronic degenerative diseases, gout, whooping cough and dry coughs[238]. The plant is normally harvested for use as it comes into flower[222, 238] and some reports say that only the flowers are used[4]. The toxic indolizidine alkaloid 'slaframine' is often found in diseased clover (even if the clover shows no external symptoms of disease). This alkaloid is being studied for its antidiabetic and anti-AIDS activity[222].

propta Pre-soak the seed for 12 hours in warm water and then sow in spring in situ. If the seed is in short supply it might be better to sow it in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. Division in spring[238].

nwatta Succeeds in a moist, well-drained circum-neutral soil in full sun[200]. Prefers a medium-heavy loam[87]. A short-lived perennial[200]. A very hardy plant, tolerating temperatures down to at least -23°c[238]. A very important food plant for the caterpillars of many butterfly and moth species[30]. It is also a good bee plant[54], but not so valuable as the white clover, *T. repens*[4]. It grows well in an apple orchard, the trees will produce tastier fruit that stores better[201]. It should not be grown with camellias or gooseberries because it harbours a mite that can cause fruit drop in the gooseberries and premature budding in the camellias[201]. Very polymorphic, there are many subspecies and varieties. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Buttercups growing nearby de-

mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta This genus has been singled out as a potential source of latex (for making rubber) for the temperate zone, although no individual species has been singled out[141]. Dynamic accumulator.

dwatta Diuretic Purgative Skin UrinaryThe dried root is an excellent purgative, though it sometimes causes vomiting, it opens the body when other more violent purgatives fail to move it[4, 207, 222]. The plant has irritating and uncertain qualities and so is seldom used in herbal medicine[4]. A tea made from the leaves is used in the treatment of diabetes[222]. An infusion of the bruised roots has been taken in the treatment of urinary diseases[257]. The juice of the plant has been rubbed on the skin as a treatment for sores, eruptions etc, especially on children's heads[257]. A decoction of the plant, mixed with other herbs (these are not specified) has been used in the treatment of cancer[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Prefers a light well-drained moderately rich loam in an open position[200]. Succeeds in dry soils[1]. Hybridizes with other members of this genus[200]. The ripe seed is released explosively from the seed capsules[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 5.2.927 *Stachys germanica*

Downy Woundwort, German hedgenettle  
4 thin 8 cyuc 0 ckak 0 tcan 2 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hraslutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Stachys germanica* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta PlasterNone known  
dwatta Antiseptic PlasterThe leaves are densely covered with long white silky hairs, they have been used as a substitute for lint in dressing wounds[4]. The thick, lint-like leaves are both soft and strongly antiseptic[245].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Easily grown in any deep, well-drained and moderately fertile soil, preferring a position in full sun[200]. The plant is a short-lived perennial and is sometimes biennial[17]. Closely related to *S. cretica* and *S. byzantina*[200].

## 5.2.928 *Dirca palustris*

Leather Wood, Eastern leatherwood  
4 thin 8 cyuc 0 ckak 0 tcan 2 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hraslutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Dirca palustris* is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in March. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Basketry Fibre Hair Paper StringThe tough flexible shoots are used in basket making and as a tying material[1, 11, 43, 46, 95]. A rope can be made from the bark fibres[1, 11, 46, 61]. The bark fibres are also used in making paper[189]. The stems are harvested in summer, the leaves are removed and the stems steamed until the fibres can be stripped. The outer and inner barks are separated by scraping or peeling. The fibres are cooked for 2 hours or less with soda ash and then beaten with mallets or put through a blender. The paper is greenish cream in colour[189]. A compound infusion of the roots has been used as a wash to strengthen the hair and make it grow[257].

dwatta Emetic Laxative Pectoral Poultice VDLeatherwood was employed medicinally by a number of native North American Indian tribes who used it to treat a wide variety of ailments[257]. It is little used in modern herbalism and any use should be carried out with caution since even minute doses can cause salivation and burning of the tongue[222]. A tea made from the bark is laxative[222]. Another report says that it is purgative and emetic, and can produce violent vomiting[235, 257]. An infusion of the roots has been used in the treatment of pulmonary problems[257]. A decoction of the branches has been applied as a poultice to swellings on the limbs[257]. The plant is a folk remedy for toothaches, facial neuralgia and paralysis of the tongue, venereal disease, and has also been used to try and induce pregnancy[222, 257].

propta Seed - best sown in a cold frame as soon as it is ripe[113]. Remove the fruit flesh since this can inhibit germination[113]. Dried seed will require 2 - 3 months cold stratification[113]. The seed usually germinates in 1 - 6 months at 15°c[175]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering.

nwatta Thrives in a moist peaty soil[1, 11] and a sheltered position[175]. Prefers a reasonably moist humus-rich limy soil according to another report[182]. The flowers are produced in early spring and they are often damaged by frost[1, 200]. They have a soft sweet perfume[245]. The species *D. occidentalis* A.Gray. is very closely related to this plant[200], so it might have the same uses[K].

## 5.2.929 *Eryngium yuccifolium*

Button Eryngo  
4 thin 8 cyuc 0 ckak 0 tcan 2 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hyishraslut hpa7tli flatprikliwisslip hpa7tmwatli fyfxre7t hjonli

drutta *Eryngium yuccifolium* is an evergreen Perennial growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta None known  
dwatta Diaphoretic Diuretic Emetic Expectorant Febrifuge Infertility SialagogueThe plant is diaphoretic, diuretic, emetic (in large doses), expectorant and febrifuge[46, 61]. A decoction of the roots has been found useful in cases of exhaustion from sexual depletion, with loss of erectile power, seminal emissions and orchitis[207]. A tincture of the roots is used in the treatment of female reproductive disorders[222]. The pounded roots are used as a diuretic[213]. An infusion of them is used to reduce fevers[213]. Chewing the root increases the flow of saliva[222]. The plant is used as an antidote to snakebites[257]. The roots are chewed and applied as a poultice to the bite[213, 274].

propta Seed - best sown as soon as it is ripe in early autumn on the surface of a well-drained compost in a cold frame[200]. The seed can also be sown in spring. It usually germinates in 5 - 90 days at 20°C. When they are large enough to handle, prick the seedlings out into individual

pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring or autumn. Take care since the plant resents root disturbance[200]. Root cuttings in autumn or winter[200].

nwatta Requires a well-drained soil and a sunny position[1]. Prefers a light sandy soil but tolerates most soil types including lime and poor gravels[200]. Plants should be put in their final position whilst small since they resent root disturbance[200]. Where this species is found growing wild in N. America, it is an indicator of native prairie[274].

### 5.2.930 Erysimum cheiranthoides

Wormseed Mustard

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc htuc cyutli kyucctup hwicli hyishrasjlutnyik hpa7tli prikIwIs hpa7tmwatli xre7t hjonli

drutta Erysimum cheiranthoides is a ANNUAL growing to 1.5 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Skin VermifugeA drink made from the crushed seed is used as a vermifuge[207]. It is intensely bitter but has been used on children and expels the worms both by vomit and by excretion[4, 207]. A decoction of the root has been applied to skin eruptions[257].

propta Seed - sow in situ in the spring[200]. Germination should take place within 3 weeks.

nwatta Requires a well-drained soil and a sunny position[200]. Dislikes acid soils[200]. Tolerates poor soils[200].

### 5.2.931 Amianthium musciticum

Fly Poison

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikIwIs hpa7tmwatli dyatxre7t hjonli

drutta Amianthium musciticum is a BULB growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta InsecticideRoot extracts mixed with molasses or honey have been used as a housefly insecticide[270].

dwatta SkinNative Cherokee used the plant as a dermatological cure for itch[270].

propta Seed - best sown as soon as it is ripe in a cold frame[134]. The seed can also be sown in a cold frame in spring[134]. It usually germinates in 1 - 6 months at 15°C, but it can be erratic[138]. Sow the seed thinly so that it does not need to be thinned and allow the seedlings to grow on undisturbed for their first year. Give an occasional liquid feed to ensure that the plants do not become nutrient deficient. When the plants are dormant in late summer, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on for another one or two years in a cold frame before planting them out when dormant in late summer.

nwatta Prefers a deep rich moisture-retentive soil in partial shade[200]. Plants like plenty of moisture in the spring and summer when they are in full growth[200]. Grows well in a woodland garden[200].

### 5.2.932 Artemisia lactiflora

White Mugwort

4 tin 8 cyuc 0 kcak 0 tcan 2 dwat 1.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikIwIs hpa7tmwatli xre7t hjonli

drutta Artemisia lactiflora is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Emmenagogue TonicWhite mugwort is a bitter aromatic tonic herb. The leaves and flowering stems are used internally in traditional Chinese medicine to treat menstrual and liver disorders[238].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn. Basal cuttings in late spring. Harvest the young shoots when about10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Landscape Uses:Border, Container, Seashore, Woodland garden. Easily grown in a well-drained circum-neutral or slightly acid loamy soil, preferring a sunny position and a moisture-retentive soil[200]. Plants are tolerant of light shade[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. There are some named varieties selected for their ornamental value[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Suitable for dried flowers.

### 5.2.933 Digitalis ferruginea

Rusty Foxglove

4 tin 9 cyuc 0 kcak 0 tcan 2 dwat 1.2 m hkuc

hmimhtut cyutli hgatkycuctup hwicli hrasjlutnyik hpa7tli flatprikIwIs hpa7tmwatli xre7t hjonli

drutta Digitalis ferruginea is a BIENNIAL/PERENNIAL growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta None known

dwatta Cardiac Stimulant TonicThe leaves are cardiac, stimulant and tonic[46, 61]. They are often used in the treatment of certain heart complaints.

propta Seed - surface sow early spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 20°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Another report says that the seed is best sown in the autumn[188].

nwatta Landscape Uses:Border, Container, Massing, Specimen, Woodland garden. An easily grown plant, succeeding in ordinary garden soil, especially if it is rich in organic matter[1]. It also succeeds in dry soils and, once established, is drought tolerant[188, 190]. It prefers semi-shade but succeeds in full sun if the soil is moist[188, 200]. Plants are hardy to about -15°C[187]. This species is a short-lived perennial[187] and is best grown as a biennial[188]. Members of this genus are rarely if ever troubled by browsing deer and rabbits[233]. Special Features: Attractive foliage, Suitable for cut flowers.

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Pre-soak stored seed for 24 hours in warm water then cold stratify for 3 months[113]. Sow spring in the greenhouse[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants resent root disturbance and are best planted out in their permanent positions as soon as possible[11]. Cuttings of half-ripe wood, July/August in a frame[200].

nwatta Landscape Uses:Specimen. Succeeds in most soils and pH types, but dislikes growing in wet soils, especially when these are of clay[200]. Prefers a deep damp sandy loam and a very sunny position[11, 182]. Succeeds in light shade[200]. Dislikes drought[200]. Repays generous treatment[11]. This species does not flower very freely in Britain. Plants do not thrive at Kew, they prefer a hotter climate[11]. The flowers are produced on the branches of the previous or earlier years, and also on the trunk of the plant[82]. Plants are susceptible to coral spot fungus, especially when growing in areas with cooler summers where the wood is not fully ripened[11]. Plants in this genus are notably resistant to honey fungus[200]. Resents root disturbance, plants should be planted into their permanent positions as soon as possible, preferably in May, and should be kept well watered until established[11]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:North American native, Blooms are very showy.

### 6.1.9 Myrica heterophylla

Bayberry

tfo2n 5 tin 9 cyuc 3 kcak 3 tcan 2 dwat 3 m hkuc

hmimhtut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatprikIwIs hpa7tmwatli nyanhjen hjonli

drutta Myrica heterophylla is an evergreen Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Condiment TeaThe following notes are for the closely related M. cerifera. It is assumed that they also apply to this species[K]. Fruit - raw or cooked[105, 177, 183]. The fruit is about 2 - 4mm in diameter with a single large seed[200]. There is very little edible flesh and this is of poor quality[K]. Leaves and berries are used as a food flavouring[62, 105, 177]. An attractive and agreeable substitute for bay leaves, used in flavouring soups, stews etc[183]. The dried leaves are brewed into a robust tea[183].

tcanta Dye Hedge Hedge Wax WoodThe following notes are for the closely related M. cerifera. It is assumed that they also apply to this species[K]. A wax covering on the fruit is extracted by scalding the fruit with boiling water and immersing them for a few minutes, the wax floats to the surface and is then skimmed off. The fruit is then boiled in water to extract the wax from the pulp and once more the wax is skimmed off. It is then strained through a muslin cloth and can be used to make aromatic candles, sealing wax etc[1, 4, 6, 11, 62, 95, 171, 245]. Candles made from this wax are quite brittle but are less greasy in warm weather[213]. They are slightly aromatic, with a pleasant balsamic odour[245], and do not smoke when put out, making them much more pleasant to use that wax or tallow candles[213]. The wax is also used in making soaps[213]. About 1 kilo of wax can be obtained from 4 kilos of berries[4]. A blue dye is obtained from the fruit[6]. The plant can be grown as an informal hedge[200], succeeding in windy sites[K]. Wood - light, soft,

brittle, fine-grained[82, 227]. The wood weighs 35lb per cubic foot[227]. It is of no commercial value[229].

dwatta Astringent Dysentery Emetic Stimulant TonicThe following notes are for the closely related M. cerifera. It is assumed that they also apply to this species[K]. The root bark is astringent, emetic (in large doses), sternutatory, stimulant and tonic[4, 21, 46, 165, 213]. It is harvested in the autumn, thoroughly dried then powdered and kept in a dark place in an airtight container[4]. It is used internally in the treatment of diarrhoea, jaundice, fevers, colds, influenza, catarrh, excessive menstruation, vaginal discharge etc[4, 238]. Externally, it is applied to indolent ulcers, sore throats, sores, itching skin conditions, dandruff etc[4, 238]. The wax is astringent and slightly narcotic[4]. It is regarded as a sure cure for dysentery and is also used to treat internal ulcers[4]. A tea made from the leaves is used in the treatment of fevers and externally as a wash for itchy skin[222].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[78]. Stored seed germinates more freely if given a 3 month cold stratification and then sown in a cold frame[78]. Germination is usually good[78]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a cold frame for the first winter. Plant out in late spring or early summer[K]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Pot up and overwinter in a cold frame then plant out in late spring or early summer. Fair to good percentage[78]. Layering in spring[200].

nwatta Prefers a moist soil[200]. Grows well in an open position in a well-drained soil in sun or light shade[200]. Thrives in any ordinary garden soil according to one report[11] whilst another says that it thrives in an acid soil[182]. Prefers a lime-free loamy or peaty soil[1]. Succeeds in dry and maritime climates[200]. Closely related to M. pensylvanica and M. cerifera[200]. Dioecious, male and female plants must be grown if seed is required. Plants in this genus are notably resistant to honey fungus[200]. Many species in this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.10 Glycyrrhiza uralensis

Gan Cao

tfo2n 5 tin 9 cyuc 3 kcak 3 tcan 4 dwat 0.6 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikIwIs hpa7tmwatli xre7t hjonli

drutta Glycyrrhiza uralensis is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: SweetenerThe fibrous root is used as a sweetener for foods[183]. It is boiled in water to extract the sugars etc and used as a liquorice substitute in sweets, medicines, drinks etc[74, 174, 177]. The root contains glycyrrhizin, which is 50 times sweeter than sugar[218].

tcanta Fire retardant InsulationLiquorice root, after the medicinal and flavouring compounds have been removed, is used in fire extinguishing agents, to insulate fibreboards and as a compost for growing mushrooms[218]. Nitrogen fixer. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Antiphlogistic Antispasmodic Antitussive Cholagogue Emollient ExpectorantGan Cao is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. It is considered to be second in importance only to Ginseng (Panax spp)[218]. Used in excess, however, it can cause cardiac dysfunction and severe hypertension[218]. The root is a sweet tonic herb that stimulates the corticosteroidal hormones, neutralizes toxins and balances blood sugar levels[238]. It is also antibacterial, anti-inflammatory, antiphlogistic, antispasmodic, anti-

the seed[21, 183].

tcanta Cosmetic Dye Essential Green manure Hair Par-  
asiticideAn essential oil is obtained from the seed - used as a  
food flavouring and medicinally. The dried plant has a strong  
aroma of hay[4]. The crushed seed, mixed with oil and mas-  
saged into the scalp, is recommended for glossy hair[244].  
An infusion of the seed, used as a skin lotion, is said to be  
good for the complexion[244]. A good green manure crop,  
it is fast growing and vigorous[200], producing a lot of bulk  
and fixing a large quantity of atmospheric nitrogen[87]. A  
yellow dye is obtained from the seed[61].

dwatta Anticholesterolemic Antinflammatory Antiphlo-  
gistic Antitumor Appetizer Cardiotoxic Carminative Demul-  
cent Deobstruent Diuretic Emollient Expectorant Febrifuge  
Galactogogue Hypoglycaemic Hypotensive Laxative Parasiti-  
cide RestorativeFenugreek is much used in herbal medicine,  
especially in North Africa, the Middle East and India. It has  
a wide range of medicinal applications[254]. The seeds are  
very nourishing and are given to convalescents and to en-  
courage weight gain, especially in anorexia nervosa[254].  
The seeds should not be prescribed medicinally for preg-  
nant women since they can induce uterine contractions[238,  
254]. Research has shown that the seeds can inhibit can-  
cer of the liver, lower blood cholesterol levels and also have  
an antiadipic effect[254]. The seed and leaves are anti-  
cholesterolemic, anti-inflammatory, antitumor, carminative,  
demulcent, deobstruent, emollient, expectorant, febrifuge,  
galactogogue, hypoglycaemic, laxative, parasiticide, restora-  
tive and uterine tonic[4, 7, 21, 147, 165, 176, 238]. The  
seed yields a strong mucilage and is therefore useful in the  
treatment of inflammation and ulcers of the stomach and in-  
testines[4, 254]. Taken internally, a decoction of the ground  
seeds serves to drain off the sweat ducts[7]. The seed is very  
nourishing and body-building and is one of the most effica-  
cious tonics in cases of physical debility caused by anaemia  
or by infectious diseases, especially where a nervous fac-  
tor is involved[7, 244]. It is also used in the treatment of  
late-onset diabetes, poor digestion (especially in conva-  
lescence), insufficient lactation, painful menstruation, labour  
pains etc[238, 244]. The seeds freshen bad breath and re-  
store a dulled sense of taste[254]. Externally, the seeds can  
be ground into a powder and used as a poultice for abscesses,  
boils, ulcers, burns etc, or they can be used as a douche  
for excessive vaginal discharge[4, 244, 254]. The leaves are  
harvested in the growing season and can be used fresh or  
dried[238]. The seeds are harvested when fully ripe and  
dried for later use[238]. Compounds extracted from the plant  
have shown cardiotoxic, hypoglycaemic, diuretic, antiphlo-  
gistic and hypotensive activity[218]. One of its constituent  
alkaloids, called 'trigonelline', has shown potential for use  
in cancer therapy. The seed contains the saponin diosgenin,  
an important substance in the synthesis of oral contracep-  
tives and sex hormones[244], whilst saponins in the plant  
have been extracted for use in various other pharmaceuti-  
cal products[238]. The German Commission E Monographs,  
a therapeutic guide to herbal medicine, approve *Trigonella*  
foenum-graecum for loss of appetite, inflammation of the skin  
(see [302] for critics of commission E).

propta Pre-soak the seed for 12 hours in warm water and  
then sow in spring in situ.

nwatta Succeeds in ordinary garden soil[1], preferring  
a well-drained loamy soil in full sun[200]. Requires a warm,  
sheltered position in Britain[244]. Plants are hardy to about  
-15°c[238]. Fenugreek is widely cultivated for its edible  
seed in warm temperate and tropical regions, there are some  
named varieties[183]. Seed production is more problematic  
in Britain due to the cooler and moister summers. The seed  
is ripened intermittently over a period of some weeks mak-  
ing harvesting more complicated[87]. Plants take about 16  
weeks to mature in warmer climes, probably about 4 weeks  
longer in Britain[200]. This species has a symbiotic relation-  
ship with certain soil bacteria, these bacteria form nodules  
on the roots and fix atmospheric nitrogen. Some of this ni-  
trogen is utilized by the growing plant but some can also be  
used by other plants growing nearby[200]. When removing  
plant remains at the end of the growing season, it is best to  
only remove the aerial parts of the plant, leaving the roots in  
the ground to decay and release their nitrogen.

## 6.1.7 Gleditsia japonica

tfo2n 5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 20 m hkuc  
htut cyutli hgatkuyctup hwicli hrasjlutnyik hpa7tli flatprikl-  
wis hpa7tmwatli xre7t hjonli

drutta Gleditsia japonica is a deciduous Tree growing  
to 20 m (65ft) by 12 m (39ft) at a medium rate. See above  
for USDA hardiness. It is hardy to UK zone 6. The species  
is hermaphrodite (has both male and female organs) and is  
pollinated by Insects. It can fix Nitrogen. Suitable for: light  
(sandy), medium (loamy) and heavy (clay) soils and prefers  
well-drained soil. Suitable pH: mildly acid, neutral and basic  
(mildly alkaline) soils. It cannot grow in the shade. It prefers  
dry or moist soil and can tolerate drought. It can tolerate  
atmospheric pollution.

kcaakta Edible Parts: Leaves SeedEdible Uses: Seed -  
cooked. The seed is roasted, dehusked, soaked until soft then  
boiled and eaten with sugar[179]. The seed contains 22.4%  
protein and 2.8% fat[218]. Young leaves - cooked[105]. A  
famine food used when all else fails[177].

tcanta SoapA soap is obtained from the pulp contained  
in the seedpods[11, 46, 61, 174]. It is obtained from the seed  
according to another report[105]. Wood - strong, durable,  
coarse-grained[82].

dwatta Antitussive Astringent Expectorant Haemostatic  
Skin VDAntitussive, astringent, expectorant, haemostatic,  
skin[174]. Treats syphilitic skin diseases[174].

propta Seed - pre-soak for 24 hours in warm water and  
then sow in spring in a greenhouse[78]. The seed should  
have swollen up, in which case it can be sown, if it has not  
swollen then soak it for another 24 hours in warm water. If  
this does not work then file away some of the seed coat but  
be careful not to damage the embryo[78]. Further soaking  
should then cause the seed to swell. One it has swollen, the  
seed should germinate within 2 - 4 weeks at 20°c. As soon as  
they are large enough to handle, prick the seedlings out into  
individual deep pots and plant them out into their permanent  
positions in the summer. Give the plants some protection  
from the cold for their first few winters outdoors.

nwatta Easily grown in a loamy soil, requiring a sunny  
position[11]. Succeeds in most soils[200]. Tolerates drought  
once established[1] and atmospheric pollution[200]. A  
rather tender plant, especially when young, it is seen at its  
best in southern Britain[11]. Older trees, however, are com-  
pletely hardy in Britain[11]. Trees at Kew produced lots  
of pods and fertile seeds in the hot summer of 1989, they  
also fruited well in the cool summer of 1993 and also in  
1994, 95 and 96[K]. Trees are cultivated for their seedpods  
in Japan[61]. Trees have a light canopy, they come into leaf  
late in the spring and drop their leaves in early autumn[200]  
making them an excellent canopy tree for a woodland gar-  
den. Plants in this genus are notably resistant to honey fun-  
gus[200]. This species has a symbiotic relationship with cer-  
tain soil bacteria, these bacteria form nodules on the roots  
and fix atmospheric nitrogen. Some of this nitrogen is uti-  
lized by the growing plant but some can also be used by other  
plants growing nearby[200].

## 6.1.8 Cercis occidentalis

Western Redbud, California Redbud  
tfo2n 5 tlin 9 cyuc 3 kcaak 3 tcan 0 dwat 4.5 m hkuc  
hmimhtut cyutli kyucup hwicli hrasjlut hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Cercis occidentalis is a deciduous Shrub growing  
to 4.5 m (14ft 9in) at a medium rate. See above for USDA  
hardiness. It is hardy to UK zone 7 and is not frost tender.  
It is in flower from April to May. The species is hermaphrodite  
(has both male and female organs) and is pollinated by Bees.  
It can fix Nitrogen. It is noted for attracting wildlife. Suit-  
able for: light (sandy) and medium (loamy) soils and prefers  
well-drained soil. Suitable pH: mildly acid, neutral and bas-  
ic (mildly alkaline) soils. It can grow in semi-shade (light  
woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Seed SeedpodEdible  
Uses: Flowers - raw. Added to salads[183], they have a  
pleasant acid taste[K]. The flower buds are pickled like ca-  
pers[183]. Seedpods - roasted[161, 177, 183]. The pods are  
up to 9cm long[229]. Seed - cooked[183].

tcanta Nitrogen Fixer

dwatta None known

## 5.2.934 Verbascum nigrum

Dark Mullein, Black mullein  
4 tlin 8 cyuc 0 kcaak 2 tcan 3 dwat 1 m hkuc  
htut cyutli kyucup hwicli hrasjlutnyik hpa7tli flatprikl-  
wisslip hpa7tmwatli fyfxfre7t hjonli

drutta Verbascum nigrum is a BIENNIAL/PERENNIAL  
growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA  
hardiness. It is hardy to UK zone 5. It is in flower from  
June to October, and the seeds ripen from August to Octo-  
ber. The species is hermaphrodite (has both male and fe-  
male organs) and is pollinated by Flies, Lepidoptera (Moths  
and Butterflies). The plant is self-fertile. Suitable for: light  
(sandy), medium (loamy) and heavy (clay) soils and prefers  
well-drained soil. Suitable pH: mildly acid, neutral and basic  
(mildly alkaline) soils and can grow in very alkaline soils. It  
cannot grow in the shade. It prefers dry or moist soil.

kcaakta None known

tcanta Dynamic accumulator

dwatta Anodyne Antiseptic Demulcent Diuretic Expec-  
torant PectoralThe flowers and leaves are anodyne, antiseptic,  
astringent, demulcent, emollient, expectorant, pectoral  
and vulnerary[21, 238]. An infusion is used internally in  
the treatment of various respiratory complaints including  
coughs, bronchitis, asthma and throat irritations[238]. An  
infusion of the fresh or dried flowers in olive oil is used to  
treat earaches, sores, wounds, boils etc[238]. The plant is  
harvested when in flower and should be dried quickly and  
with care or it will lose its medicinal qualities[238].

propta Seed - sow late spring to early summer in a cold  
frame and only just cover the seed[200]. Germination usually  
takes place within 2 - 3 weeks. When they are large enough to  
handle, prick out the seedlings into individual pots and plant  
them out in late summer. The seed has a long viability[200].  
Division in spring. This plant is a short-lived perennial that  
grows away very well from seed, so we do not try and divide  
it.

nwatta An easily grown plant, it succeeds in most well-  
drained soils, including dry ones, preferring a sunny posi-  
tion[111, 200]. Dislikes shade and wet soils[124, 200].  
Plants only really thrive when they are grown on chalky  
soils[200]. Prefers a light soil[200]. This species is fairly  
reliably perennial[200], but only when grown on light or  
medium soils[111]. A very ornamental plant, it often self-  
sows[1, 111]. Hybridizes with other members of this genus,  
though the progeny are usually sterile[200]. In garden de-  
sign, as well as the above-ground architecture of a plant, root  
structure considerations help in choosing plants that work  
together for their optimal soil requirements including nutri-  
ents and water. The root pattern is fleshy. Thick or swollen  
- fibrous or tap root [2-1].

## 5.2.935 Daphne genkwa

Lilac Daphne  
4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikl  
hpa7tmwatli xre7t hjonli

drutta Daphne genkwa is a deciduous Shrub growing to  
1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness.  
It is hardy to UK zone 5. It is in flower from April to May.  
The species is hermaphrodite (has both male and female or-  
gans) and is pollinated by Bees, flies, Lepidoptera (Moths and  
Butterflies). Suitable for: medium (loamy) and heavy (clay)  
soils. Suitable pH: mildly acid and neutral soils. It can grow  
in semi-shade (light woodland) or no shade. It prefers moist  
soil.

kcaakta None known

tcanta None known

dwatta Abortifacient Anticoagulant Antiseptic Antitus-  
sive Antiviral Diuretic Purgative Stomachic VesicantThis  
plant has a history of herbal use going back over 3,500  
years[238]. It is commonly used in Chinese herbalism, where  
it is considered to be one of the 50 fundamental herbs[218].  
The flower buds are a bitter acrid herb that is used to control  
coughs. The buds are anticoagulant, antiseptic, antitussive,  
antiviral, diuretic, purgative and stomachic[147, 174, 175,  
176, 178, 218]. They are used internally in the treatment  
of bronchitis, constipation, oedema and skin diseases[238].  
The buds are also used as an abortifacient[238]. They are ap-  
plied externally in the treatment of frostbite[238]. The buds

are harvested and dried in the spring[238] and are used af-  
ter they have been stored for several years[174]. The root is  
abortifacient, anticoagulant, diuretic, purgative and vesi-  
cant[218].

propta Seed - best sown in a greenhouse as soon as it is  
ripe with the pot sealed in a polythene bag to hold in the  
moisture. Remove this bag as soon as germination takes  
place[164]. The seed usually germinates better if it is har-  
vested 'green' (when it has fully developed but before it dries  
on the plant) and sown immediately. Germination should nor-  
mally take place by spring, though it sometimes takes a fur-  
ther year. Stored seed is more problematic. It should be  
warm stratified for 8 - 12 weeks at 20°c followed by 12 - 14  
weeks at 3°c. Germination may still take another 12 months  
or more at 15°c[164]. Prick out the seedlings into individual  
pots as soon as they are large enough to handle. Grow the  
plants on in the greenhouse for their first winter and then  
plant out in spring after the last expected frosts. Cuttings  
of half-ripe wood, July/August in a frame. Root cuttings, De-  
cember in a greenhouse.

nwatta There is some disagreement over whether this  
species needs an acid or alkaline soil. According to some  
reports it requires a lime-free porous soil and semi-shade[1,  
200] whilst another report says that it is probably best in  
a deep rubbly well-drained soil in a warm corner and kept  
well watered in a dry growing season[11]. Yet another report  
says that it grows best in a neutral to alkaline soil in sun or  
semi-shade[238]. A good sandy loam suits most members of  
this genus[11]. Plants are hardy to about -20°c, but they are  
short-lived and difficult to grow in cultivation in Britain[11,  
184]. This might be because our summers are not warm  
enough for the plants to develop properly[11, 184], they  
seem to be fully hardy after hot summers[188]. It is tricky  
to get this plant to flower because the buds are formed in the  
autumn on wood of that year's growth and they may not sur-  
vive our variable winters[11, 182]. Produces suckers when  
growing in its native habitat. Plants are best grown on their  
own roots, grafted plants tend to be unsatisfactory. Plants  
are resentful of root disturbance and should be planted into  
their permanent positions as soon as possible[188].

## 5.2.936 Stratiotes aloides

Water Soldier  
4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Stratiotes aloides is a PERENNIAL growing to 1  
m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness.  
It is hardy to UK zone 5. It is in flower from June to August.  
The species is hermaphrodite (has both male and female organs).  
Suitable for: light (sandy), medium (loamy) and heavy (clay)  
soils. Suitable pH: mildly acid, neutral and basic (mildly al-  
kaline) soils. It can grow in semi-shade (light woodland) or  
no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta The herb has had a high reputation for treating  
wounds, especially when these are made by an iron imple-  
ment. It is applied externally[4]. The plant is also said to  
be of use in the treatment of St. Anthony's Fire and also of  
bruised kidneys[4].

propta Seed - best sown in situ as soon as it is ripe. The  
seed is seldom if ever produced in Britain[17]. Division at  
almost any time of the year, though spring is best.

nwatta A water plant, it requires a neutral to alkaline  
water[200]. The herb is submerged at most times of the  
year, rising to the surface only when it is flowering[17]. The  
leaves accumulate calcium carbonate and by the autumn  
this makes them heavy enough to sink to the bottom of the  
pond. The new leaves in spring do not have this calcium car-  
bonate and so rise to the surface[200]. A vigorous-growing  
plant, it will tend to swamp out other plants when grown in  
a small pond[200]. Plants are dioecious, male and female  
plants must be grown if seed is required[17]. Only the fe-  
male plant occurs naturally in Britain, though plants with  
hermaphrodite flowers are also found occasionally[17]. Seed  
is never set in Britain, the plants increasing mainly by off-  
sets[17].

## 5.2.937 Rhododendron ferrugineum

Alpenrose

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkuc  
hminhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat  
hpa7tmwatli xre7t hjonli

drutta Rhododendron ferrugineum is an evergreen Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta HerbicidePlants can be grown as ground cover when spaced about 1 metre apart each way[208]. Some substances in this plant have shown herbicidal activity, though more research needs to be carried out[7].

dwatta Antirheumatic Diaphoretic Diuretic HomeopathyThe flowers, leaves and the galls are antirheumatic, diaphoretic and diuretic[7, 9, 61]. It is used in the treatment of certain forms of arthritis and rheumatism, but can cause diarrhoea and vomiting so should only be used with expert supervision[9]. A homeopathic remedy is made from the plant[7]. It is used in treating a variety of complaints involving flatulence[7].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. This species grows better in the midlands and north Britain, disliking the hotter conditions in the south[11]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 5.2.938 Corydalis vaginans

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat m hkuc  
hminhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis  
hpa7tmwatli fyfxxre7t hjonli

drutta Corydalis vaginans is a ANNUAL/BIENNIAL. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta OphthalmicThe sap of the plant is used in the treatment of eye diseases[240].

propta Seed - surface sow in situ in the spring[222].

nwatta Prefers a moist, well-drained rather light soil, thriving in semi-shade[1]. Grows well in a woodland garden or peat bed. Plants in this genus seem to be immune to the predations of rabbits[233].

## 5.2.939 Daphne mezereum

Mezereon, Paradise plant, February Daphne

4 tlin 7 cyuc 0 kcaak 0 tcan 2 dwat m hkuc  
hmin cyutli tcup hwicli jlytnyikfrip hpa7tli flatpriklwis  
hpa7tmwatli fyfxxre7t hjonli

drutta Daphne mezereum is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from February to March, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known

tcanta Dye OilA yellow to greenish-brown dye is obtained from the leaves, fruit and bark[13]. The seed contains up to 31% of a fatty oil[74]. No further details are given.

dwatta Antirheumatic Antiseborrhic Cancer Cathartic Diuretic Emetic Homeopathy Rubefacient Stimulant VesicantMezereum has been used in the past for treating rheumatism and indolent ulcers, but because of its toxic nature it is no longer considered to be safe[238]. The plant contains various toxic compounds, including daphnetoxin and mezerein, and these are currently being investigated (1995) for their anti-leukaemia effects[238, 254]. The bark is cathartic, diuretic, emetic, rubefacient, stimulant and vesicant[4, 7, 9, 21, 46]. The root bark is the most active medically, but the stem bark is also used[4]. It has been used in an ointment to induce discharge in indolent ulcers[4] and also has a beneficial effect upon rheumatic joints[254]. The bark is not usually taken internally and even when used externally this should be done with extreme caution and not applied if the skin is broken[4, 21, 254]. The bark is harvested in the autumn and dried for later use[7]. The fruits have sometimes been used as a purgative[4]. A homeopathic remedy is made from the plant[7]. It is used in the treatment of various skin complaints and inflammations[7, 9].

propta Seed - best sown in a greenhouse as soon as it is ripe with the pot sealed in a polythene bag to hold in the moisture. Remove this bag as soon as germination takes place[164]. The seed usually germinates better if it is harvested 'green' (when it has fully developed but before it dries on the plant) and sown immediately. Germination should normally take place by spring, though it sometimes takes a further year. Stored seed is more problematic. It should be warm stratified for 8 - 12 weeks at 20°C followed by 12 - 14 weeks at 3°C. Germination may still take another 12 months or more at 15°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow the plants on in the greenhouse for their first winter and then plant out in spring after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Layering.

nwatta Landscape Uses:Border, Foundation, Specimen. A good sandy loam suits most members of this genus[11]. Prefers a good heavy soil and some shade[31, 49]. Prefers a calcareous soil[13, 17, 19] and cool moist conditions[11, 49]. There is no evidence to suggest it requires a calcareous soil, but all members of this genus do well on acid soils[11]. A very ornamental plant[1], it is hardy to about -30°C[184]. Plants tend to be short-lived in cultivation, probably due to excessive seed bearing[11, 200]. Plants are resentful of root disturbance and should be planted into their permanent positions as soon as possible[188]. They also resent being cut and so should not be pruned unless it is essential[245]. A good bee plant, providing a source of nectar very early in the year[108]. The flowers have a delicious sweet perfume[245]. Special Features:Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms.

## 5.2.940 Eupatorium cannabinum

Hemp Agrimony

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 1.5 m hkuc  
hminhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli fyfxxre7t hjonli

and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Root - cooked[105, 171]. Rich in starch[109]. The root can be up to 1.8 metres long[174] and has been known to weigh 35 kilos or more[269]. The root contains about 10% starch, this can be extracted and used as a crispy coating in deep fried foods, or for thickening soups etc[174, 183]. It can also be made into noodles, or like agar or gelatine is used as a gelling agent for salads[183]. This plant is a staple food in Japan, the peeled root contains about 2.1% protein, 0.1% fat, 27.1% carbohydrate, 1.4% ash[179]. The starch of the roots contains (per 100 g) 340 calories, 16.5 percent moisture, 0.2 g protein, 0.1 g fat, 83.1 g total carbohydrate, 0.1 g ash, 35 mg Ca, 18 mg P, 2.0 mg Fe, and 2 mg Na[269]. A nutritional analysis for the whole root is available. Flowers - cooked or made into pickles[183]. Stems and young leaves - raw or cooked[105]. A very nutritious food, the fresh young shoots taste like a cross between a bean and a pea[183]. The cooked leaves contain (per 100 g) 36 calories, 89.0 percent moisture, 0.4 g protein, 0.1 g fat, 9.7 g total carbohydrate, 7.7 g fiber, 0.8 g fat, 34 mg Ca, 20 mg P, 4.9 mg Fe, 0.03 mg thiamin, 0.91 mg riboflavin, 0.8 mg niacin[269].

tcanta Fibre Fodder Paper Soil reclamation Soil stabilizationA tough, strong fibre from the stems is used to make ropes, cables, coarse cordage and textiles[61, 109, 151, 169, 189]. The fibre is 2 - 3mm long and can be used to make paper. Straight first year stems, 2 - 2.7 metres long, are harvested in mid summer, the leaves are removed and the stems steamed until the fibres can be stripped. The fibres are then cooked for 2 hours with lye, tough vines might require 4 hours cooking, and the fibre put in a ball mill for 3 hours. The resulting paper is greenish/cream in colour[189]. Can be used as a ground cover plant in a sunny position[188]. Plants have an extensive root system which can be 1.8 metres deep, they are used for erosion control and for rebuilding depleted soils[171, 174]. A member of the Leguminosae, so it adds nitrogen to the soil through the actions of root bacteria.

dwatta Antidiarrhoeal Antidote Antiemetic Antihistamine Antineoplastics Antipruritic Antipsoriatic Antipyretic Antispasmodic Antivinous Cardiac Demulcent Depurative Diaphoretic Dysentery Fibrifuge Galactogogue Hypoglycaemic Hypotensive StypticThe kudzu vine, known as Ge Gen in China, is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. Recent research has shown that compounds called 'daidzin' and 'daidzein', which are contained in the roots and the flowers, are a safe and effective method for treating alcohol abuse[238]. They work by suppressing the appetite for alcohol, whereas existing treatments interfere with the way the alcohol is metabolised and can cause a build-up of toxins[238]. The plant is often used in combination with Chrysanthemum x morifolium in treating alcohol abuse[254]. The flowers and the roots are antidote, antiemetic, antipyretic, antispasmodic, demulcent, diaphoretic, digestive, fibrifuge, hypoglycaemic and hypotensive[174, 176, 218, 222, 238]. A concoction of the flowers and tubers is used to treat alcoholism, fever, colds, diarrhoea, dysentery, acute intestinal obstruction etc[174, 176, 218, 222]. It is useful in the treatment of angina pectoris and migraine[218]. The root is frequently used as a remedy for measles, often in combination with Cimicifuga foetida[254]. The root contains puerarin. This increases the blood flow to the coronary artery and protects against acute myocardial ischaemia caused by the injection of pitiuitrin[176]. The root can be harvested from the autumn to the spring and is used fresh or dried[238]. The flowers are harvested just before they are fully open and are dried for later use[238]. The stems are galactogogue and are also applied as a poultice to incipient boils, swellings, sore mouths etc[218, 222]. The seed is used in the treatment of hangover and dysentery[218, 222]. The leaves are styptic[218].

propta Pre-soak the seed for 12 hours in warm water and sow in a warm greenhouse in early spring. Germination should take place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out after the last expected frosts[200]. Cover the young plants with a frame or cloche until they are growing away well. Division of young shoots from the crown. The young shoots are removed in the spring with some of the underground part of the stem, preferably with some roots already formed. They are potted up and will usually develop

new roots from the nodes. They are planted out in the summer if growth is sufficient, otherwise they are grown on in pots for a year and planted out late the following spring.

nwatta Agroforestry Services: Nitrogen Fodder: Bank Fodder: Pasture Industrial Crop: Fiber Management: Hay Minor Global Crop Staple Crop: ProteinGrows best on well-drained loam soil of good fertility[269]. Succeeds in most well-drained soils in a sunny position[200], though it does not make good growth on very light poor sand or on poorly drained heavy clay[269]. Plants cannot stand waterlogging on any soil[269]. A deep-rooted plant, once established it is very drought resistant[171, 269]. The plant is reported to tolerate an annual precipitation in the range of 97 to 214cm, an annual mean temperature in the range of 12.2 to 26.7°C, and a pH of 5.0 to 7.1[269]. Plants are hardy to about -15°C, they can resprout from the base if they are cut down by frosts[200]. A twining plant, the top growth is not generally hardy in Britain and plants do not always flower here[1]. Plants can be grown as annuals in Britain, the seed is started off in a greenhouse and is planted out after the last frosts[1]. They can grow up to 6 metres in their first year and make good temporary screens[1]. The plant succeeds outdoors in Berlin, but it has to be propagated vegetatively there[74]. This plant is cultivated for its edible root in Japan and China[183]. The flowers have a sweet vanilla scent[245]. When grown in warmer climates than Britain the root can be invasive and plants have become weeds[182, 219]. Introduced into the southern N. American states in 1876 as a soil stabilizer, the plant has spread very widely (it can grow up to 30cm in a day), has swamped out native vegetation, including large trees. It is considered to be one of the most obnoxious weeds in that region[274]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.6 Trigonella foenum

Fenugreek, Sicklefruit fenugreek

tfo2n 5 tlin 9 cyuc 4 kcaak 0 tcan 5 dwat 0.6 m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Trigonella foenum-graecum is a ANNUAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Seed SeedpodEdible Uses: Coffee Condiment TeaSeed - cooked or sprouted and eaten raw[2, 4, 21, 34]. It has quite a strong spicy flavour, not unlike lovage or celery[4, 183]. When ground into a powder, the seed is a principal ingredient of curries and mango chutney[244], it is also used in pickles and spice mixes, as a flavouring in bread etc[4, 183, 238]. The seed is usually lightly roasted before use in order to reduce the bitterness[238]. The seed is about 3mm long, about 10 - 20 seeds being produced in each pod[4]. A good source of many essential elements such as iron, phosphorus and sulphur[244], the seed contains about 6% moisture, 23% protein, 10% carbohydrate, 8% fat, 10% fibre and 4.3% ash[61]. The ground seeds are used to give a maple syrup flavour to foods[183]. The seed can be soaked for 12 hours in warm water and then allowed to sprout for 3 - 5 days[244]. These sprouted seeds have a spicy flavour and can be added to salads or cooked[238, KJ]. An essential oil obtained from the seed is used as a food flavouring in imitation maple syrup, vanilla compositions, liquorice, pickles etc[183]. It also has medicinal virtues[57]. The ground up seeds can also be used as a substitute for maple syrup[4]. Leaves - raw or cooked[2, 4, 7, 34]. Very aromatic, in small quantities they can be added to salads, otherwise they are used as a potherb, a flavouring for root vegetables, an ingredient of curries etc[183, 238]. Seedpods - cooked[105]. The roasted seed is a coffee substitute[2, 177, 183]. A soothing tea is made from the leaves and



out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta An easily grown plant[184]. It succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. Prefers a light sandy loam and a sunny position but succeeds in light shade[11, 200]. Very drought and wind resistant[1, 11, 200]. Tolerates atmospheric pollution[160]. Plants are hardy to about -20°c[184], but the roots are hardy to -30°c (although top growth will be killed at this temperature). Cultivated for its edible fruit in Japan, there are some named varieties[3, 11, 183]. Plants can crop in 4 years from cuttings[160]. They bear heavily in Britain[11]. The fruit is well hidden in the shrub and is quite difficult to harvest without damaging the plant[K]. This sub-species produces brown fruits on long stalks[200], would this be any easier to harvest?[K] This species is notably resistant to honey fungus[88, 200]. Birds love the fruits[160]. There is some confusion over the correct name for this species. In the on-line version of the Flora of Japan it is referred to as *Elaeagnus montana ovata*[275]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. The small flowers are deliciously scented, their aroma pervading the garden on calm days[K].

### 6.1.4 Elaeagnus x ebbingei

Elaeagnus, Ebbing’s Silverberry
tfo2n 5 tlin 9 cyuc 5 kcak 4 tcan 2 dwat 5 m hkuc
pcimhmimhtut cyutli hgatkyuctup hwicli hyishrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Elaeagnus x ebbingei is an evergreen Shrub growing to 5 m (16ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from October to January, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[177]. A reasonable size, it is about 20mm long and 13mm wide although it does have a large seed[K]. The fully ripe fruit has a very rich flavour and makes pleasant tasting with a slight acidity[K]. The fruit should be deep red in colour and very soft when it is fully ripe, otherwise it will be astringent[K]. The flavour improves further if the fruit is stored for a day or two after being picked. The fruit ripens intermittently over a period of about 6 weeks from early to mid April until May[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K]. The taste is vaguely like peanuts[K].

tcanta Companion Hedge HedgePlants can be grown as a hedge in very exposed positions, tolerating maritime exposure. The plants provide a very good protection from the wind, they are very resistant to damage by salt winds and are also tolerant of regular trimming[75]. They have a strong vigorous growth and are faster growing than *E. macrophylla*[75, 200]. Because they fix atmospheric nitrogen, they make good companion plants and improve the growth of neighbouring species[K]. They can be planted in the line of an old shelterbelt of trees that is becoming bare at the base and will in time fill up the empty spaces and climb into the bottom parts of the trees[K].

dwatta CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids,

which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - this is a hybrid and it will not breed true from seed. If this is not a problem, then the seed is best sown as soon as it is ripe in a cold frame[78]. It should germinate freely within 4 weeks, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Rather slow, but you usually get a good percentage rooting[78]. June is the best time to take cuttings[202]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta A very easily grown plant, it succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. A drought resistant plant once established, it can be grown on top of Cornish hedges (drystone walls with earth between two vertical layers of stones). It is very tolerant of shade and grows well under trees[200]. Plants are very tolerant of maritime exposure, growing well right by the coast[K]. Plants are hardy to about -20°c, but they can be deciduous in very cold winters[200]. Fruiting as it does in early April to May, this plant has excellent potential as a commercial fruit crop in Britain. The fruit is of a reasonable size and when fully ripe is very acceptable for dessert[K]. It should be fairly easy to selectively breed for improved fruit size and flavour[K]. Not all plants bear many fruits, though many specimens have been seen that produce very heavy crops on a regular basis[K]. Since this is a hybrid species, yields may be improved by growing a selection of cultivars or one of the parent plants nearby for cross pollination. *E. pungens* is perhaps the best candidate for this and its cultivar *E. pungens* 'Variegata' has been seen on a number of occasions with good crops of fruit next to *E. x ebbingei* plants that are also laden with fruit[K]. The cultivar *E. x ebbingei* 'Gilt Edge' is also probably a good pollinator[K]. Other cultivars worth looking at are 'Salcombe Seedling', which is said to flower more abundantly than the type[200] and 'Limelight', which has been seen with a good crop of fruits even on small bushes[K]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Plants produce very aromatic flowers in late autumn and early winter[182]. This species is notably resistant to honey fungus[88, 200]. Sometimes whole branches die out for no apparent reason. This happens most frequently when it is grafted onto *E. multiflora*[182]. These branches should be removed from the plant. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 6.1.5 Pueraria montana lobata

Kudzu Vine
tfo2n 5 tlin 9 cyuc 4 kcak 4 tcan 5 dwat m hkuc
htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Pueraria montana lobata is a PERENNIAL CLIMBER growing to 10 m (32ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral

drutta Eupatorium cannabinum is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known
tcanta Preservative RepellentThe leaves have been laid on bread in order to prevent it from becoming mouldy[4]. The leaf juice has been rubbed onto the coats of animals as an insect repellent[7].

dwatta Alternative Antitumor Cholagogue Depurative Diaphoretic Diuretic Emetic Expectorant Febrifuge Homeopathy Laxative Purgative TonicHemp agrimony has been employed chiefly as a detoxifying herb for fevers, colds, flu and other viral conditions. It also stimulates the removal of waste products via the kidneys[254]. Due to its content of alkaloids, the plant should only be used under professional supervision[254]. The leaves and flowering tops are alterative, cholagogue, depurative, diuretic, emetic, expectorant, febrifuge, purgative and tonic[4, 7, 9, 21, 46, 238]. The plant has a long history of use as a gentle laxative that does not provoke irritation[7], though excessive doses cause purging and vomiting[238]. A tea made from the dried leaves will give prompt relief if taken at the onset of influenza[4]. Recent research has shown that the plant might have anti-tumour activity, though the plant also contains pyrrolizidine alkaloids that can cause damage or cancer to the liver[238]. The plant is harvested in the summer and dried for later use[7]. The roots are diaphoretic, laxative and tonic[7]. They are harvested in the autumn and dried for later use[238]. Recently the plant has been found of use as an immune system stimulant, helping to maintain resistance to acute viral and other infections[254]. A homeopathic remedy is made from the leaves[4]. It is used in the treatment of influenza and feverish chills[4] and also for disorders of the liver, spleen and gall bladder[9].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. If you have sufficient seed it can be sown outdoors in situ. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta An easily grown plant[233], it succeeds in ordinary garden soil in sun or part shade[200]. Prefers a rich moist soil[187]. Grows well in marshy soils[21]. Plants are hardy to about -25°c[187]. A very ornamental plant[1], it has a pleasant aromatic smell when cut[4]. Often found as a weed in British gardens, it can be allowed to naturalize in short grass in the wild garden[233]. Plants seem to be immune to the predations of rabbits[233]. An excellent bee and butterfly plant[24, 108].

### 5.2.941 Gillenia trifoliata

Indian Physic, Bowman’s root
4 tlin 9 cyuc 0 kcak 0 tcan 3 dwat 1.2 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprk hpa7tmwatli xre7t hjonli

drutta Gillenia trifoliata is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known
dwatta Cathartic Diaphoretic Emetic Expectorant Odontalgic Stings TonicThe dried powdered root bark is cathartic, slightly diaphoretic, a mild and efficient emetic, expectorant and tonic[4, 61, 213, 238]. Minute doses are used inter-

nally in the treatment of colds, chronic diarrhoea, constipation, asthma and other bronchial complaints[238, 257]. The roots have been used externally in the treatment of rheumatism[257]. A cold infusion of the roots has been given, or the root chewed, in the treatment of bee and other stings[257]. The roots are harvested in the autumn, the bark is removed and dried for later use[213, 238]. A tea made from the whole plant is strongly laxative and emetic[222]. Minute doses are used internally in the treatment of colds, indigestion, asthma and hepatitis[222]. A poultice or wash is used in the treatment of rheumatism, bee stings and swellings[222]. A decoction or strong infusion of the whole plant has been taken a pint at a time as an emetic[257]. A poultice of the plant has been used to treat leg swellings[257]. The plant has been used in the treatment of toothaches[257].

propta Seed - sow spring or autumn in a cold frame[200]. Prick out the seedlings when they are large enough to handle and grow on for the first year in a lightly shaded area of the greenhouse or cold frame. Plant out in late spring and protect from slugs until well established. Division in spring or autumn[238].

nwatta Landscape Uses:Border, Rock garden, Specimen, Woodland garden. Easily grown in a rather moist but well-drained lime-free peaty soil in semi-shade[4, 200]. Succeeds in any well-drained soil[188]. Succeeds in a sunny position but requires shade at the hottest part of the day[200]. A very ornamental plant, but it can be difficult to establish due to slug damage[187]. The stems usually require support[188]. Special Features:North American native, Naturalizing.

### 5.2.942 Aconitum japonicum

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 1 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Aconitum japonicum is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known
dwatta Analgesic AntirheumaticThis is a widely used herbal remedy in China, where it is cultivated for its root[218]. The root is analgesic, antirheumatic, cardiotonic and stimulant[174, 218]. Used in the treatment of neuralgia[174]. Use with caution, and only under the supervision of a qualified practitioner. The plant is very poisonous and should not be used internally[218].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. A very ornamental plant[233], it grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. Closely related to *A. chinensis*[1].

### 5.2.943 Verbascum densiflorum

Mullein
4 tlin 8 cyuc 0 kcak 2 tcan 2 dwat 1.2 m hkuc
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprklwisslip hpa7tmwatli fyfjxre7t hjonli

drutta Verbascum densiflorum is a BIENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardi-

ness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta Dynamic accumulator.

dwatta Anodyne Antirheumatic Antiseptic Astringent Demulcent Diuretic Emollient Expectorant Pectoral VulneraryThe flowers and leaves are anodyne, antiseptic, astringent, demulcent, emollient, expectorant and vulnerary[4, 9, 13, 21, 46, 53, 165, 238]. An infusion is used internally in the treatment of various respiratory complaints including coughs, bronchitis, asthma and throat irritations[9, 238]. An infusion of the fresh or dried flowers in olive oil is used to treat earaches, sores, wounds, boils etc[238]. The plant is harvested when in flower and should be dried quickly and with care or it will lose its medicinal qualities[9, 238].

propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta Succeeds in most well-drained soils, including dry ones, preferring a sunny position[200]. Dislikes shade and wet soils[200]. Thrives on chalk[200]. Prefers a light soil[200]. Plants are hardy to about -20°c[187]. This species is closely related to *V. phlomoides*[200]. Hybridizes with other members of this genus, though the progeny are usually sterile[200].

## 5.2.944 *Bromus ramosus*

Hairy Brome

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikwiw hpa7tmwatli xre7t hjonli

drutta *Bromus ramosus* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Uncertainty', 'Despondency' and 'Dissatisfaction'[209].

propta Seed - sow spring or autumn in situ and only just cover. Germination should take place within 2 weeks. If seed is in short supply it can be surface sown in a cold frame in early spring. When large enough to handle, prick out the seedlings into individual pots and plant them out in early summer. Division in spring. Large clumps can be planted out direct into their permanent positions whilst it is best to pot up smaller clumps and grow them on in a cold frame until they are ready to be planted out.

nwatta Succeeds in a sunny position in most well-drained soils[138, 200].

## 5.2.945 *Herniaria glabra*

Rupture Wort, Smooth rupturewort

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat m hkuc htut cyutli hgatyuctcup hwicli hyshrasjlut hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta *Herniaria glabra* is a BIENNIAL/PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta CleanserA good ground cover plant, allowing spring bulbs to grow through it[200]. An aqueous extract of the plant is a hand cleanser, making the skin soft and supple[240].

dwatta Antirheumatic Astringent Diuretic Expectorant-The whole plant, gathered when in flower, is astringent, very actively diuretic and expectorant[4, 9, 61, 240, 254]. It appears to have an antispasmodic effect upon the bladder and is used in the treatment of dropsy, catarrh of the bladder, cystitis and kidney stones[240, 254]. It has also gained a reputation for treating hernias[4, 9, 61]. Externally, it has been used as a poultice to speed the healing of ulcers[254].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Grows well in hot dry soils[1]. Dislikes excessive moisture[1]. Succeeds in very poor soils[1]. Useful for covering rocks or as a carpet bedding[1], it makes a good ground cover for spring bulbs since they can grow through it easily[200]. The leaves emit a musky smell when they are handled[245].

## 5.2.946 *Melanthium virginicum*

Bunchflower

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 1.7 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikliw hpa7tmwatli xre7t hjonli

drutta *Melanthium virginicum* is a PERENNIAL growing to 1.7 m (5ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta None known

dwatta AnthelminticThe root has been used to kill internal parasites[207].

propta Unless the seed is stored in damp sand at around 4°C it has a short viability[200]. Where possible it is best to sow the seed in a lightly shaded position in a cold frame as soon as it is ripe[200]. Stored seed needs to be cold stratified but can be very slow to germinate. Germination can be erratic even for seed sown when it was fresh, it usually takes place within 3 - 12 months at 15°C but can be much longer[200]. Sow the seed thinly so that it can be grown on in the pot without disturbance for the first couple of years. Give an occasional liquid feed in the growing season to ensure the plants do not become nutrient deficient. The plant produces just one seed leaf in its first year; this forms an over-wintering bulb. At the end of the second year's growth, pot up the over-wintering bulbs, placing one or two bulbs in each pot. Grow them on in a lightly shaded position in a cold frame for at least another couple of years before planting them out into their permanent positions. It takes up to 10 years for the plant to reach maturity[200]. Division in March/April or in October. Establish the plants in pots in a shaded frame before planting them out[200]. Root cuttings, 6mm long with a bud, rooted in a sandy soil in a cold frame[200].

nwatta Requires a deep fertile moisture retentive humus-rich soil[200]. Succeeds in full sun if the soil does not dry out but prefers a position in semi-shade[200]. Dislikes dry soils[42]. Grows best in a cool woodland garden or a north facing border[42]. Succeeds in acid soils in a bog garden[200].

## 5.2.947 *Pulsatilla pratensis*

Pasque Flower

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 0.5 m hkuc

and size shown above) information on the habit and root pattern is also useful and given here if available. A suckering vine sending up suckers some distance main plant [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 6.1.2 *Elaeagnus multiflora*

Goumi, Cherry silverberry

tfo2n 5 tlin 9 cyuc 5 kcak 3 tcan 2 dwat m hkuc hmimhtut cyutli hgatyuctcup hwicli hyshrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Elaeagnus multiflora* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[1, 3, 11, 15, 46, 177]. Pleasantly acid when ripe, they make a very good dessert fruit[K] though they are usually made into pies, preserves etc[183]. Quite fiddly and difficult to pick without breaking the young shoots[200]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The fruit contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

tcanta Companion Hedge Hedge RootstockPlants can be grown as a hedge in exposed positions, tolerating maritime exposure. Reasonably fast growing and providing a good screen in the summer, though much more open in the winter. It is a good companion hedge to grow, the plants enriching the soil and improving the growth of neighbouring plants[K]. A hedge in a very exposed position at Rosewarne in N. Cornwall was 3.5 metres tall in 1989[K]. Often used as a rootstock for evergreen species that are hard to grow from cuttings. It frequently sprouts from the base and can out-compete the scion[182].

dwatta Antitussive Astringent CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214]. The leaves are used in the treatment of coughs[218]. The fruit is prescribed in the treatment of watery diarrhoea[218]. The root is astringent, a decoction is used to treat itch and foul sores[218].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta An easily grown plant[184], it succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. Prefers a light sandy loam and a sunny position but succeeds in light shade[11, 200]. Very drought and wind resistant[1, 11, 200]. Tolerates atmospheric pollution[160]. Plants are hardy to about -20°c[184], but the roots are hardy to -30°c (although top growth will be killed at this temperature). A very variable species[266], it is often cultivated for its edible fruit in Japan, there are some named varieties[3, 11, 183]. Plants can crop in 4 years from

cuttings[160]. They bear heavily in Britain[11]. The synonym *E. longipes* is sometimes accepted as a distinct species, differing mainly in having very long peduncles about 2.5cm in length[214]. The fruit is well hidden in the shrub and is quite difficult to harvest without damaging the plant[K]. The ssp. *E. multiflora ovata*. (Maxim.)Servettaz. produces brown fruits on long stalks[200], would this be any easier to harvest?[K]. This species is notably resistant to honey fungus[88, 200]. Birds love the fruits[160]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. The small flowers are deliciously scented with a lilac-like smell, their aroma pervading the garden on calm days[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.1.3 *Elaeagnus multiflora ovata*

Goumi

tfo2n 5 tlin 9 cyuc 5 kcak 3 tcan 2 dwat m hkuc hmimhtut cyutli hgatyuctcup hwicli hyshrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Elaeagnus multiflora ovata* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[1, 3, 11, 15, 46, 177]. Pleasantly acid when ripe, they are usually made into pies, preserves etc[183]. Quite fiddly and difficult to pick without breaking the young shoots[200], this sub-species carries the fruit on longer stalks than the species and might therefore be easier to pick[K]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The fruit is about 10mm long and contains a single large seed[275, K] Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

tcanta Hedge Hedge RootstockPlants can be grown as a hedge in exposed positions, tolerating maritime exposure. A hedge in a very exposed position at Rosewarne in N. Cornwall was 3.5 metres tall in 1989[K]. Often used as a rootstock for evergreen species that are hard to grow from cuttings. It frequently sprouts from the base and can out-compete the scion[182].

dwatta CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate in late winter or early spring, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant

The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta MordantThe root can be used as an alum substitute, this is a mordant that is used in fixing dyes[168]. The root is rich in tannin and it has been suggested that this is the mordant[168]. A good ground cover plant for the woodland garden[200]. Plants should be spaced about 35cm apart each way[208].

dwatta Astringent Cancer Dysentery VulneraryThe root is very astringent and has been used in the treatment of cancer and also as an external remedy in sores, wounds, vaginal discharges and ulcers[207, 238]. It can be dried, ground into a powder and sprinkled onto wounds etc[213]. It is taken internally in the treatment of diarrhoea, dysentery and gastric ulcers[238]. It should be used with some caution since excess irritates the stomach and can cause kidney and liver failure[238]. The root is harvested in the autumn and is dried for use in decoctions or as a powder[238].

propta Seed - sow early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. Division in March or October[1, 111]. It is best to divide the plants in August or early September, making sure that the woody roots are planted quite deeply with only the crown of foliage above the ground[233].

nwatta Landscape Uses:Border, Foundation, Specimen. Succeeds in any good sweet garden soil that does not dry out in spring[1]. Prefers full sun but tolerates partial shade[1, 111]. Prefers a well-drained fairly rich and not too heavy soil[111]. A polymorphic species[4], it is apt to hybridize with other members of this genus[111]. Special Features:Attractive foliage, North American native, Suitable for cut flowers. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.1022 Pulsatilla patens

Pasque Flower, Eastern pasqueflower, Cutleaf anemone
4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Pulsatilla patens is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Appetizer Digestive Diuretic Emmenagogue Expecto­rant Irritant Oxytoxic StimulantAppetizer, digestive, diuretic, emmenagogue, expecto­rant, stimulant[61, 207, 213].

Use of the plant lessens sexual excitement. It does not diminish sexual power but rather strengthens it by lessening morbid excitement[207]. A drug derived from the chopped whole plant induces vomiting and irritation of the kidneys[213]. In high doses it acts as a depressant on the central nervous system and the heart[213]. A decoction of the plant has been used to speed delivery of a child[257]. A poultice of the fresh crushed leaves has been applied in the treatment of rheumatism and neuralgia[257]. A volatile oil contained in the plant is used as an irritant[212].

propta Seed - best sown as soon as it is ripe in early summer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame.

nwatta Requires a well-drained humus-rich gritty soil and a sunny position[200]. Lime tolerant[1, 200]. A very ornamental plant[1]. Large plants transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

# 6 5 tlin

## 6.1 bwon

### 6.1.1 Lathyrus tuberosus

Earthnut Pea, Tuberous sweetpea
tfo2n 5 tlin 9 cyuc 5 kcaak 3 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lathyrus tuberosus is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked or raw[2, 27, 46, 61, 105]. Sweet and starchy, it is delicious when baked with a flavour that is somewhat like a sweet potato[183, K]. Taste trials consistently place this root very highly, it is certainly one of our favourites[K]. Unfortunately, yields are rather low and so the plant is only worthwhile growing as a taste treat, not as a staple crop[K].

tcanta Nitrogen fixer. Attractive flowers. Attracts wildlife.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, then it can also be sown in situ in mid spring[200]. Division of the tubers when the plant is dormant in spring or autumn.

nwatta An easily grown plant, succeeding in any moderately good garden soil[200]. It prefers a limestone soil in a warm position[13], and likes some shade[1]. A climbing plant, scrambling through other plants and supporting itself by tendrils[219]. It tends to be slightly invasive[187] with new stems emerging at some distance from the parent plant[219]. The earthnut pea has occasionally been cultivated for its edible root[2, 183]. Slugs are inordinately fond of this plant and will totally destroy it given a chance[K]. A good bee plant. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc.

htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwissip hpa7tmwatli fyifxre7t hjonli

drutta Pulsatilla pratensis is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Plants can be grown to form a ground cover, they are best spaced about 30cm apart each way[208].

dwatta Homeopathy Ophthalmic SkinConsidered by herbalists to be of highly valuable modern curative use as a herbal simple[4], the whole plant is alterative, antispasmodic, diaphoretic and nervine[4]. The plant is harvested soon after flowering and should be carefully preserved by drying[4]. It should not be stored for longer than 12 months before being used[4]. Use with caution, see notes above on toxicity. The whole plant is used externally to treat ulcers and inflammations of the eyes[232]. A homeopathic remedy is made from the whole fresh plant, gathered when in flower[232]. It has a wide range of applications and is especially useful in the treatment of babies and children[232].

propta Seed - best sown as soon as it is ripe in early summer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame. Some care is needed since the plant resents root disturbance[200].

nwatta Requires a well-drained humus rich gritty soil in a sunny position[200]. Tolerates alkaline soils[200]. Prefers lime[187]. Established plants are fairly drought tolerant[190]. Plants are hardy to about -20°C[187]. Large plants transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.948 Anemone obtusiloba

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Anemone obtusiloba is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antirheumatic Emetic Ophthalmic Rubefacient-The roots, mixed with milk, are administered internally in the treatment of contusions[240]. They are used externally as a blistering agent[240]. The juice of the root is ophthalmic[272]. The seeds taken internally induce vomiting[211, 240], whilst an oil extracted from them is used in the treatment of rheumatism[211].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down, or in early spring.

nwatta Succeeds in ordinary garden soil but prefers a rich sandy loam[1]. Requires a well-drained humus-rich

soil in full sun[200]. Requires a warm sheltered position[1]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. This species is very closely related to *A. rupestris*[211].

### 5.2.949 Scopolia carniolica

Scopolia, European scopolia
4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Scopolia carniolica is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antispasmodic Dysentery Hypnotic Mydriatic NarcoticThe dried root is hypnotic, mydriatic and narcotic[4, 46, 61]. It causes a sleep that resembles normal sleep[4]. The medicinal activity of this plant resembles belladonna (*Atropa belladonna*) but it is more narcotic[46]. It is used internally in the treatment of chronic diarrhoea, dysentery, stomach ache and manic-depressive states[238]. A very toxic plant, it should only be used under the supervision of a qualified practitioner[238]. The root is harvested in the autumn and normally processed for extraction of the alkaloids which are used in the pharmaceutical industry[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Scopolia carniolica* for liver and gallbladder complaints (see [302] for critics of commission E).

propta Seed - sow spring in a greenhouse[K]. The seed is best sown in the autumn[188]. Germination is quick and easy[K]. Prick out the seedlings into individual pots once they are large enough to handle and plant them out in the summer[K]. Division in spring[188]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Prefers a light, fertile, well-drained dry soil in a shady position[1, 200]. A very ornamental plant[1], it is occasionally cultivated for its medicinal uses[46].

### 5.2.950 Eupatorium hyssopifolium

Hyssopleaf thoroughwort
4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Eupatorium hyssopifolium is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta The plant is used as a strewing herb and to discourage insects[61].

dwatta StingsThe entire plant is applied externally as a remedy for the bites of reptiles and insects[207].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Succeeds in ordinary well-drained but moisture retentive garden soil in sun or part shade[200]. Plants seem to be immune to the predations of rabbits[233].

## 5.2.951 *Iris versicolor*

Blue Flag, Harlequin blueflag

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hnmihmtut cyutli tucphja7n hwicli hrasjlut hpa7tli flatprikklwis  
hpa7tmwatli fyfxre7t hjonli

drutta *Iris versicolor* is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta Litmus Repellent WeavingA fine blue infusion is obtained from the flowers and this can be used as a litmus substitute to test for acids and alkalis[4]. The leaves have been used to weave baskets and mats[257]. Some native North American Indian tribes used the root as a protection against rattlesnakes. It was believed that, so long as the root was handled occasionally to ensure the scent permeated the person and their clothes, rattlesnakes would not bite them. Some tribes even used to chew the root and then hold rattlesnakes with their teeth and were not bitten so long as the scent persisted[257].

dwatta Alterative Antiinflammatory Cathartic Cholagogue Diuretic Emetic Sialagogue StimulantBlue flag was one of the most popular medicinal plants amongst various native North American Indian tribes[213]. In modern herbalism it is mainly employed to detoxify the body - it increases urination and bile production and has a mild laxative effect[254]. Some caution should be exercised in its use, however, since there are reports that it is poisonous[222]. The fresh root is quite acrid and when taken internally causes nausea, vomiting, colic and purging[4, 238]. The dried root is much less acrid[4]. This remedy should not be prescribed for pregnant women[238]. The root is alterative, anti-inflammatory, cathartic, cholagogue, diaphoretic, diuretic, emetic and sialagogue[21, 46, 165, 238]. Taken internally as a tea, the root has been used as a strong laxative or emetic that also acts strongly on the liver and promotes the excretion of excess body fluids[4, 213]. It is also stimulant for the circulatory and lymphatic system[165]. Its detoxifying effect make it useful in the treatment of psoriasis, acne, herpes, arthritis, swollen glands, pelvic inflammatory disease etc[238, 254]. Externally, it is applied to skin diseases, wounds and rheumatic joints[238]. The roots are harvested in late summer and early autumn and are usually dried for later use[4, 238]. The roots were boiled in water and then mashed to make a poultice which was used to relieve the pain and swelling associated with sores and bruises[213].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done in early autumn after flowering, but can also be done in mid-spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers growing in marshy conditions[1]. Very easily grown in any damp soil[42]. Prefers a heavy rich moist soil[4] and partial shade[188]. Prefers a sunny position[233]. Plants are hardy to about -25°C[187]. This species has been cultivated by the N. American Indians as a medicinal plant[207, 213]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 5.2.952 *Anemone nemorosa*

Wood Anemone, European thimbleweed

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc  
pcimhnmihmtut cyutli hgatkyuctcup hwicli hrasjlutnyik  
hpa7tli flatprikklwisslip hpa7tmwatli fyfxre7t hjonli

drutta *Anemone nemorosa* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a fast rate. See above for

USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta None known

dwatta Antirheumatic Homeopathy Rubefacient Tonic-The leaves are antirheumatic, rubefacient and tonic[7, 19, 46]. The plant is sometimes used externally as a counter-irritant in the treatment of rheumatism[7]. The herb is gathered in spring before the plant comes into flower[7]. Various parts of this herb used to be recommended for a variety of complaints such as headaches and gout, though the plant is virtually not used nowadays[4]. A homeopathic remedy has been made from the leaves[7].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Prefers a moist soil[1, 90, 200] but tolerates dry conditions during its summer dormancy[200]. Plants tolerate dry conditions and drought so long as there is plenty of humus in the soil[190]. Prefers a well-drained humus-rich soil[200]. Dislikes very acid soils[13]. Prefers a shady position, growing well on woodland edges[24, 90], but plants can also be naturalized in thin turf[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. The plant has a running rootstock and can spread rapidly when well-sited[4]. A very ornamental plant[1], there are several named varieties[190].

## 5.2.953 *Asperula cynanchica*

Squinancy Wort

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.4 m hkuc  
hnmihmtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli prikl-  
wisslip hpa7tmwatli xre7t hjonli

drutta *Asperula cynanchica* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta DyeA red dye is obtained from the root[4].

dwatta The plant was at one time esteemed as a remedy for quinsy, but it is no longer used in herbal medicine[4].

propta Seed - sow spring to early summer in a light position in a cold frame[134]. 2 weeks pre-chilling improves the germination rate[134]. The seed usually germinates in 1 month at 10°C[134]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or early summer[200]. Basal cuttings of soft young shoots in early summer[200].

nwatta Succeeds in almost any soil, including dry ones[1]. Prefers a well-drained moisture retentive soil in sun or semi-shade[200].

## 5.2.954 *Apocynum androsaemifolium*

Spreading Dogbane

4 tlin 8 cyuc 0 kcaak 1 tcan 2 dwat 0.6 m hkuc

grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antidiarrhoeal Antispasmodic Diaphoretic Hypnotic Nervine Sedative TonicNerve root has a high reputation for its sedative and relaxing effect on the nervous system[238, 254]. The root is a pungent bitter-sweet herb with an unpleasant odour. It was much used by the North American Indians who used it as a sedative and antispasmodic to ease menstrual and labour pains and to counter insomnia and nervous tension[238, 254]. The root is antispasmodic, diaphoretic, hypnotic, nervine, sedative, tonic[21, 46, 165, 192, 222, 238]. It is taken internally in the treatment of anxiety, nervous tension, insomnia, depression and tension headaches[238]. The active ingredients are not water soluble and so the root is best taken in the form of a tincture[222]. The plant is said to be the equivalent of Valerian (*Valeriana officinalis*) in its effect as a nervine and sedative, though it is less powerful[1, 4]. Another report says that its restorative effect appears to be more positive than that of valerian[254]. The roots are harvested in the autumn and are dried for later use[238]. In the interests of conservation, it is best not to use this herb unless you can be certain it was obtained from a cultivated source - see the notes above under cultivation details[K].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division with care in early spring, the plants resent disturbance[200]. Remove part of the original rootball with the soil intact[200]. Division is best carried out towards the end of the growing season, since food reserves are fairly evenly distributed through the rhizome[230]. Small divisions of a lead and two buds, or divisions from the back (older) part of the rhizome without any developed buds, establish quickly using this method[230]. Replant immediately in situ[230].

nwatta Succeeds in shade or full sun so long as there is adequate moisture[42]. Grows well in a woodland garden[230]. Plants are best grown on a north or north-west aspect in order to slow down early growth[1]. Requires a humus rich soil with plenty of moisture in the growing season[42], it also succeeds in chalky soils[200]. Must not be planted too deeply[42]. A very ornamental plant[1] it is long-lived when once established, though it is very difficult to establish a plant[233]. The flowers have a soft, rose-like aroma[245]. Plants are growing very well at the Savill Gardens in Windsor[233]. This plant is becoming very rare in the wild due to overcollecting for medicinal usage[238]. Reports that the plant is cultivated for its medicinal uses are largely spurious and, unless you can be certain that the root has come from a cultivated source, it is best not to use this plant medicinally but to use suitable substitutes such as *Scutellaria laterifolia* and *Lavandula angustifolia*[238]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230].

## 5.2.1020 *Adiantum pedatum*

Northern Maidenhair,American Maidenhair Fern

4 tlin 9 cyuc 0 kcaak 2 tcan 2 dwat 0.5 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis  
hpa7tmwatli hjonli

drutta *Adiantum pedatum* is a FERN growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA

hardiness. It is hardy to UK zone 3. The seeds ripen from August to October. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta Basketry Hair LiningThe stipe of the plant is used as an ornament in basketry[172, 157]. The leaves can be used as a lining for carrying or storing fruits in baskets and on racks[257]. The plant is used as a hair conditioner[172]. The stems have been used as a hair wash to make the hair shiny[222]. Plants can be used for ground cover when planted about 30cm apart either way, they form a slowly spreading clump[208].

dwatta Antirheumatic Astringent Demulcent Emmenagogue Expectorant Febrifuge Haemostatic Pectoral TonicThe whole plant is considered to be antirheumatic, astringent, demulcent, emmenagogue, expectorant, febrifuge, haemostatic, pectoral and tonic[172, 222, 240]. A tea or syrup is used in the treatment of nasal congestion, asthma, sore throats etc[222]. A decoction of the root was massaged into rheumatic joints[257]. The N. American Indians chewed the fronds and then applied them to wounds to stop bleeding[213]. A strong infusion of the whole plant was has been used as an emetic in the treatment of ague and fevers[257]. This plant was highly valued as a medicinal plant in the 19th century and merits scientific investigation[222].

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep them humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division in spring or autumn.

nwatta Landscape Uses:Container, Foundation, Ground cover, Massing, Rock garden, Woodland garden. Easily grown in a cool moist shady position[1, 187]. Requires an abundance of moisture in the air and soil[1]. Prefers an alkaline soil[200]. Requires an acid soil according to another report. A very ornamental plant[1], it does not always succeed outdoors in Britain[1]. It probably prefers to be covered in snow overwinter - could a mulch help[1]? This species is often divided into three separate species by botanists - the type species is found in eastern N. America. A. aleuticum is found in western N. America and a third species is found in eastern Asia[270]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants have a slowly-increasing root-stock[233]. Special Features:Attractive foliage, North American native, Naturalizing, Wetlands plant, There are no flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.1021 *Heuchera americana*

Rock Geranium, American alumroot, Alumroot, Coral Bells, Rock Geranium

4 tlin 9 cyuc 0 kcaak 2 tcan 3 dwat 0.5 m hkuc  
hnmihmtut cyutli tcup hwicli hrasjlut hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Heuchera americana* is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September.

flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. Plants are intolerant of root disturbance[200].

### 5.2.1016 Eriogonum jamesii

Antelope Sage, James' buckwheat

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 0.3 m hkuc htut cyutli kyucctup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Eriogonum jamesii is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known
tcanta None known

dwatta Analgesic Cardiac Contraceptive Ophthalmic StomachicSome native North American Indian tribes used this plant as a contraceptive. The women would drink one cup of a decoction of the root during menstruation[213]. A decoction of the whole plant has been drunk to ease the pain of childbirth[257]. The root has been chewed as a cardiac medicine and as a treatment for stomach aches[257]. An infusion of the roots has been used to treat despondency[257]. The infusion has also been used as a wash for sore eyes[257]. The plant has been chewed to sweeten the saliva[257].

propta Seed - best sown as soon as it is ripe in the autumn in a sandy compost in a greenhouse. Sow stored seed in early spring in a warm greenhouse[1]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Division in early spring[1]. This has to be done with care because the plant resents root disturbance[200]. Try to obtain divisions from around the edges of the plants without digging up the whole clump. Tease the divisions out with as much root on them as possible and pot them up. Grow them on in light shade in the greenhouse until they are rooting well and plant them out in the summer. Cuttings of greenwood with a heel in the summer[200].

nwatta Requires a loose lean gritty well-drained soil in a very sunny position[200]. Succeeds in dry soils. Tolerates exposed positions[200]. Requires some protection from winter wet[1]. Established plants deeply resent root disturbance[200].

### 5.2.1017 Chondrilla ambigua

Chondrilla, Sha di fen bao ju

4 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.5 m hkuc htut cyutli kyucctup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Chondrilla ambigua is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None Known

tcanta Possibly a hydrocarbon latex crop. The species was experimentally cultivated in the USSR during the years

1929–1937 as a source of rubber. Carbon Farming Solutions - Industrial Crop: hydrocarbon (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1].

dwatta None Known
propta Seed

nwatta Experimental Crop
Industrial Crop: Hydrocarbon Management: HayClimate: cold to warm temperate. Humidity: semi-arid to humid. A woody, broomlike perennial herb usually growing to 0.5m but can reach 1m high. It has a taproot which can be very deep and highly branched. Usually found in Sand dunes, gravel and loess (a type of silt which forms fertile topsoil - The soil has few clay particles to hold it together) areas; Grows at 300-800m in the wild. Needs a well drained dry to moist soil. This genus is closely related to the dandelions of genus Taraxacum. Plants of both genera undergo apomixis, producing fertile seeds via asexual reproduction. Carbon Farming Solutions - Cultivation: experimental. Management: hay (Describes the non-destructive management systems that are used in cultivation) [1-1].

### 5.2.1018 Liatris squarrosa

Scaly blazing star, Alabama blazing star

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.9 m hkuc hmimhtut cyutli kyucctup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Liatris squarrosa is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta RepellentThe plant is used as an insect repellent in the clothes cupboard[4].

dwatta Diuretic Poultrice TonicThe root is diuretic and tonic[4, 61, 238]. A poultice made from the roots is applied to snake bites[238].

propta Seed - best sown as soon as it is ripe in autumn in a greenhouse[200]. Sow stored seed as soon as possible in the year in a greenhouse. Prick out the seedlings into individual pots when they are large enough to handle and grow the plants on in the greenhouse for their first year. Plant them out into their permanent positions in early summer. Division in spring[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings taken in spring as growth commences. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Grows well in a moderately good light soil[200].Tolerates poor soils[200]. Plants are prone to rot overwinter in wet soils[200]. A good bee plant. Rodents are very fond of the tubers so the plants may require some protection[200].

### 5.2.1019 Cypripedium calceolus pubescens

Nerve Root

4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Cypripedium calceolus pubescens is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can

pcimhmimhtut cyutli kyucctup hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli xre7t hjonli

drutta Apocynum androsaemifolium is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta Fibre LatexThe bark yields a good quality fibre that is used for making twine, bags, linen etc[4, 99, 155, 257]. It is inferior to A. cannabinum[99]. The fibre is finer and stronger than cotton[207]. It can be harvested after the leaves fall in the autumn but is probably at its best as the seed pods are forming[169]. The plant yields a latex, which is a possible source of rubber[46, 61]. It is obtained by making incisions on the stem and resembles indiarubber when dry[4].

dwatta Cardiotonic Cathartic Contraceptive Diaphoretic Diuretic Emetic Expectorant Urinary VDSpreading dogbane is an unpleasantly bitter stimulant irritant herb that acts on the heart, respiratory and urinary systems, and also on the uterus[238]. It was widely employed by the native North American Indians who used it to treat a wide variety of complaints including headaches, convulsions, earache, heart palpitations, colds, insanity and dizziness[257]. It should be used with great caution, and only under the supervision of a qualified practitioner if taking this plant internally[21, 238]. The root contains cymarin, a cardioactive glycoside that is toxic to ruminants[222]. The root is cardiotonic, cathartic, diaphoretic, diuretic, emetic and expectorant[1, 4, 21, 61, 222]. It has a powerful action in slowing the pulse and also has a very strong action on the vaso-motor system, it is rather an irritant to the mucous membranes though, so some people cannot tolerate it[4]. The juice of the fresh root has been used in the treatment of syphilis[207]. The sap of the plant has been applied externally to get rid of warts[257]. The roots were boiled in water and the water drunk once a week in order to prevent conception[213]. The green fruits were boiled and the decoction used in the treatment of heart and kidney problems and for the treatment of dropsy[213]. This preparation can irritate the intestines and cause unpleasant side-effects[213].

propta Seed - best sown as soon as it is ripe in late summer and overwintered outdoors. The seed requires a period of cold stratification if it is to germinate well[238]. Prick out the seedlings when large enough to handle and grow them on in a cold frame for their first winter, planting out in late spring of the following year[K]. Division in spring just before active growth begins[200]. Plants can also be divided in the autumn[238].

nwatta Prefers an acid peaty soil[1] but it succeeds in sun or shade in most well-drained soils and climates[169, 200]. A very ornamental plant[1], but it can be invasive[200]. The flowers the flowers secrete a sweet liquid that is very attractive to flies[4]. The flies are then imprisoned by their proboscis which becomes trapped between the short filaments of the stamens[207].

#### 5.2.955 Primula involucrata

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 0.3 m hkuc hmim cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Primula involucrata is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta None known

tcanta None known

dwatta DysenteryThe entire plant is used in Tibetan medicine, it is said to have a sweet and bitter taste and a cooling potency[200]. Antidysenteric, anti-inflammatory and febrifuge, it is used in the treatment of contagious diseases and dysentery[241].

propta Seed - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. Germination is inhibited by temperatures above 20°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in autumn. This is best done every other year[200].

nwatta Prefers a moist position in partial shade, such as along the edge of a stream or in a woodland garden[200]. In such a position the plant is usually long-lived[200]. If conditions are too dry the plant may become dormant by late summer[200]. Grows well in heavy clay soils. The flowers have a delicious sweet honey perfume[245].

### 5.2.956 Aplectrum hyemale

Putty Root, Adam and eve

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.5 m hkuc pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aplectrum hyemale is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from October to May, in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta AdhesiveA glue can be obtained from the tubers. The roots are bruised with a small addition of water, this gives a strong cement that is used for repairing broken pots, glass etc[207, 230].

dwatta Analgesic Pectoral PoultriceThe roots are macerated to a paste and applied to boils or used to treat head pains[207, 222, 257]. A tea made from the roots has been used in the treatment of bronchial troubles[222]. The roots were given to children by some tribes of native North American Indians in order to endow the children with the gift of eloquence and to make them fat[257].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Needs to be grown in the shade and humus-rich soil of a woodland garden[230]. Orchids are, in gen-

eral, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. Plants have proved to be amenable to cultivation[230].

### 5.2.957 Gentiana saponaria

Harvestbells

4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 0.8 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Gentiana saponaria is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known
tcanta None known

dwatta Antidote Appetizer Bitter Digestive Stomachic TonicThe root is said to be an antidote to snakebites[61]. This N. American species has medicinal properties practically identical with the European gentians[4]. The following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. The compost must be rich in organic matter and should not be allowed to become dry[239]. The seed can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric

humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species grows well in the woodland garden[200], it requires a lime-free soil[239]. Plants are intolerant of root disturbance[200]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer; it grows better in the north and west of Britain[1].

### 5.2.958 Salvia lyrata

Cancer Weed, Lyreleaf Sage

4 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Salvia lyrata is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known
tcanta None known

dwatta Diaphoretic Laxative Salve WartsThe plant is diaphoretic and mildly laxative[222]. It can be used in the treatment of diarrhoea, coughs and colds[257]. The fresh leaves are applied to remove warts[207]. The plant is also a folk remedy for cancer[222]. The leaves and seeds are made into an ointment to cure wounds and sores[207]. The root can be used to make a salve for sores[222, 257].

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Landscape Uses:Seashore. Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants can be killed by excessive winter wet[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, North American native, Attracts butterflies, Suitable for cut flowers.

### 5.2.959 Erica vagans

Cornish Heath, Cornish heath

4 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hyihshrasjlut hpa7tli frusfatprik hpa7tmwatli fyfxre7t hjonli

drutta Erica vagans is an evergreen Shrub growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta Brush Dye Fuel ThatchingA dye is obtained from the flowers. No further details. The twigs are used for making brushes, thatching, bedding etc and also as a fuel. A good ground cover plant, though it might need weeding for the first year[197]. It can be clipped in spring to give denser growth[197, 208]. Space the plants about 60cm apart each way[208].

dwatta None known

arborecens[238]. The roots contain more than 13,000 parts per million of rosmarinic acid, the same anti-oxidant that is found in rosemary[222]. The fresh leaves are strongly emetic[222]. Some caution is advised, see notes above on toxicity[222]. A poultice of the leaves or roots is applied to burns, bruises, sores, sprains etc[4, 222, 254].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can also be sown in the spring, though it might be slower to germinate. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a greenhouse or cold frame. Plant them out in spring or early summer of their second year. Division in spring[1].

nwatta Prefers a sandy peat in a moist situation but it is easily grown in ordinary garden soils[1] so long as they are not dry[200]. Prefers dappled shade[200]. The whole plant has a strong disagreeable odour and a pungent spicy taste[4]. Another report says that the foliage is strongly aromatic, with a lemon scent[238].

## 5.2.1013 Taenidia integerrima

Yellow pimperlnel

4 tlin 6 cyuc 0 kcak 2 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishshrasjlut hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Taenidia integerrima is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta Garden Uses: Woodland gardens. Native US plant gardens. Not commonly found in cultivation. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. The flowers attract small bees, wasps (including parasitic wasps), flies, and beetles. These insects seek nectar primarily, although some bees may collect pollen and some flies and beetles may feed on pollen. Some of the fly visitors include Syrphid flies, Tachinid flies, Chloropid flies, March flies, and Blow flies, while bee visitors include Nomadine bees, Little Carpenter bees, Halictid bees, Carder bees, and Andrenid bees. The caterpillars of the butterflies Papilio polyxenes asterias (Black Swallowtail) and Papilio joanae (Ozark Swallowtail) feed on the foliage of this plant; the latter insect has not been observed in Illinois, although it has been found in Missouri and western Kentucky. Little information is available about this plant's relationships to birds and mammals as a possible food source [1-6].

dwatta Native American ethnobotany. The Menominee take an infusion of root taken for pulmonary troubles, chew the steeped root for 'bronchial affections', and use it as a seasoener for other remedies because of the good smell. The Ojibwe smoke the seeds in a pipe before hunting for good luck.

propta Seed. Easy.

nwatta An herbaceous perennial plant in the parsley family. The preference is partial to full sun and dry to medium conditions. Tolerates close to full shade. Poor soil is preferred, consisting of clay, rocky material, or some sand, as this reduces the competition from other plants. This plant adapts well to slopes, although it may not remain very erect. Drought resistance is very good. Bloom Time: May to July. Bloom Description: Yellow. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 5.2.1014 Narcissus poeticus

Poet's Narcissus

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc

htut cyutli tcup hwicli hrasjlutnyikprik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Narcissus poeticus is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta EssentialAn essential oil is obtained from the flowers. 500kg of the flowers yields 1kg concrete, 300gr absolute of the essential oil[46, 61].

dwatta Emetic Homeopathy IrritantThe bulb is powerfully emetic and irritant[4]. A homeopathic remedy is made from the bulb[4].

propta Seed - best sown as soon as it is ripe in a cold frame. A short stratification will improve the germination of stored seed. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first two years of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in the summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. Division of bulbs after the leaves die down in early summer[1]. Larger bulbs can be replanted immediately into their permanent positions, or can be stored in a cool place and then be planted out in the autumn. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in the autumn.

nwatta Prefers a deep rather stiff soil but succeeds in moist soils and situations[1]. Grows well in heavy clay soils. Easily grown in a moist soil, doing well in grass[90] but it is slow to establish[188]. The dormant bulbs are fairly hardy and will withstand soil temperatures down to at least -5°C[214]. A very ornamental plant[1], but it is sometimes shy to flower[90]. The flowers are powerfully scented[245].

## 5.2.1015 Gentiana decumbens

4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Gentiana decumbens is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known

dwatta StomachicA tincture of the plant is used as a stomachic[240].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach



drutta *Coreopsis rosea* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil.

kcakta None Known

tcanta A good ground cover with medium to high density growing at a fast rate. Plants will spread in the garden by rhizomes and self-seeding to form a dense ground cover, sometimes to the point of being considered aggressive [368-1]. Ornamental: Long summer bloom and airy foliage provide good accent in borders or rock gardens. Good small area ground cover. Also effective as an edger for borders, foundations and walks/paths. Naturalized areas, native plant gardens or cottage gardens [368-1]. Wildlife Food: Attracts birds that eat the seeds. Insectory: Provides for food for pollinators [1-2]. A good cut flower.

dwatta None known

propta Sow seeds at 55° to 61°F in mid- or late winter, or divide plants in early spring. Basal cuttings can be rooted in spring.

nwatta An herbaceous perennial for temperate areas. USDA Hardiness Zones: 4 - 9. Soil pH: 6.6 - 7.8. Growth Rate: Moderate. Life Span: Long-Lived Perennial. Stand Persistence: Long. Form: Creeping. Texture: Fine. Sun: Full Sun, Partial Shade. Soil Type: Sandy, Loamy, Silty. Soil Moisture: Wet, Moderate. Root Type: Rhizome. Seasonal Interest: Summer-Fall. Spreads via rhizome and seeds, can be aggressive. Seeds resemble ticks, hence the name tickseed. Fruit is a cypsela. Flower Color: Pink, Yellow. Drought: Sensitive. Flood: Sensitive. Salt: Moderate [318-1]. Bloom Time: Early Summer - Early Fall. Fruit Time: Summer - Fall. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.1010 *Anthemis arvensis*

Corn Chamomile

4 tlin 8 cyuc 0 kcak 2 tcan 2 dwat 0.4 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprik-wisslip hpa7tmwatli fyfjxre7t hjonli

drutta *Anthemis arvensis* is a ANNUAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta Can be used as an ornamental plant.

dwatta Febrifuge This species is considered to be one of the best febrifuge species indigenous to France[4]. The flowers and leaves are used[4].

propta Seed - best sown outdoors as soon as it is ripe. Most of the seed germinates in the autumn.

nwatta Prefers a sunny position and a well-drained soil that is neutral to slightly acid[1, 200]. Succeeds in heavy clay soils.

## 5.2.1011 *Arnica fulgens*

Hillside Arnica, Foothill arnica

4 tlin 8 cyuc 0 kcak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Arnica fulgens* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antiechymotic Antiphlogistic Irritant Nervine Sternutory Tonic VulneraryThe whole plant, but especially the flowers and the root, is antiechymotic, antiphlogistic, irritant, nervine, sternutory, tonic and vulnerary[61, 172]. This plant is used in North America in much the same way as *A. montana* is used in Europe[254]. These uses are as follows:- Arnica has a long history of herbal use, especially as an external treatment for bruises and sprains[232, 238] - it is an ingredient of a number of proprietary preparations[238]. Internally, it has been used in the treatment of heart complaints and as a booster for the immune system[238]. Arnica increases local blood supply and accelerates healing, it is anti-inflammatory and increases the rate of absorption of internal bleeding[254]. Generally the plant is nowadays only recommended for internal use as a homeopathic medicine, principally for treating shock, injury and pain[254]. If used as a decoction or tincture it stimulates the circulation and is valuable in the treatment of angina and a weak or failing heart, but it can be toxic even at quite low doses and so is rarely used this way[254]. The flowers are the part most commonly used[4, 232], they are harvested when fully open and dried - the receptacles are sometimes removed since these are liable to be attacked by insects[4]. The root is also used, it is harvested after the leaves have died down in the autumn and dried for later use[4]. The whole plant is antiechymotic, antiphlogistic, nervine, sternutory, vulnerary[4, 7, 9, 46, 165]. Although a very valuable remedy, it should be used with caution. It has been known to cause contact dermatitis when used externally and collapse when taken internally[238]. Only take it internally under the supervision of a qualified practitioner. The freshly crushed flowers cause sneezing if inhaled[232]. The leaves have also been smoked as a tobacco[232], though it is unclear whether this was for medicinal reasons The whole plant, harvested when in flower, is used in homeopathic remedies[232]. It is especially useful in the treatment of traumatic injuries, sores and bruises[232].

propta Seed - sow early spring in a cold frame[200]. Only just cover the seed and make sure that the compost does not dry out. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Prefers a moist, well-drained humus rich soil, preferably lime-free[200]. Prefers a mixture of sand, loam and peat[1].

## 5.2.1012 *Collinsonia canadensis*

Stone Root - Horse Balm, Richweed

4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 0.8 m hkuc hmim cyutli tcuphja7n hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Collinsonia canadensis* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta None known

tcanta None known

dwatta Alterative Antispasmodic Diaphoretic Diuretic Sedative Tonic Urinary Vasodilator VulneraryThe whole plant, but especially the fresh root, is alterative, antispasmodic, diaphoretic, diuretic, sedative, tonic, vasodilator and vulnerary[4, 21, 46, 102, 165]. A tea made from the roots is strongly diuretic, it is valuable in the treatment of all complaints of the urinary system and the rectum and is used in the treatment of piles, indigestion, diarrhoea, kidney complaints etc[4, 222]. It has proved of benefit in the treatment of irritable bowel syndrome, mucous colitis and varicose veins[254]. The root is seldom used on its own but is contained in remedies with other herbs, especially *Aphanes arvensis*, *Eupatorium purpureum* and *Hydrangea*

propta Seed - surface sow in an acid sandy compost in a cold frame in spring. Keep moist. Prick out the plants as soon as they are large enough to handle and plant them in their permanent positions when they are 5 - 8cm tall[11]. Cuttings of half-ripe wood, 3cm long taken from twiggy lateral growths near the base of the plant, July/August in a frame. Remove the leaves from the bottom part of the stem without causing any damage to the bark. The cuttings root in a few weeks if they are given some bottom heat. Plant out in spring[11]. Layering in spring or autumn. Plants can be 'dropped' and then dug up and divided about 6 - 12 months later. Dropping involves digging up the plant and then replanting it about 15 - 20cm deeper in the soil to encourage roots to form along the stems[78].

nwatta A calcifuge plant, it requires a light lime-free loam[11]. Grows well on sunny slopes, thriving in any soil that is not heavy or alkaline[11]. Plants can succeed in a slightly alkaline soil if it is rich in humus according to some reports[182, 188]. Grows best in a poor soil[11]. Resents dry soils. Prefers an open situation. A very ornamental plant[1], there are many named varieties[182]. A food plant for the caterpillars of many species of butterflies and moths as well as providing a food source for the moths and butterflies[30]. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 5.2.960 *Gentiana dahurica*

4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Gentiana dahurica* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Analgesic Antiinflammatory Antipyretic Antirheumatic Diuretic HypotensiveThe roots of gentian species contain some of the most bitter compounds known and make an excellent tonic for the whole digestive system, working especially on the stomach, liver and gall bladder[238]. The root is analgesic, anti-inflammatory, antipyretic, antirheumatic, diuretic, febrifuge, hypoglycaemic and hypotensive[176, 218, 238]. The root is used internally in the treatment of arthritis, allergic inflammations, low-grade fever in chronic diseases, jaundice and hepatitis[176, 218, 238]. The root is harvested in the autumn and dried for later use.

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring

or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species prefers an alkaline soil, but can succeed in neutral to slightly acid conditions[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. Many of the plants and seeds offered under this name are wrongly identified, usually being *G. gracilipes*, *G. cruciata* or *G. decumbens*[239]. Plants are intolerant of root disturbance[200].

## 5.2.961 *Anthemis tinctoria*

Yellow Camomile, Golden chamomile, Dyers' Chamomile, Golden Marguerite

4 tin 6 cyuc 0 kcak 0 tcan 1 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli prikwlisslip hpa7tmwatli fyfjxre7t hjonli

drutta *Anthemis tinctoria* is an evergreen Perennial growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies), flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta DyeA distinctive yellow dye is obtained from the flowers[14, 17, 46, 61, 89, 169, 244].

dwatta Antispasmodic Emmenagogue VesicantThe whole plant is antispasmodic, diaphoretic, emetic, emmenagogue and vesicant[4]. It is used internally as a tea, which can be made either from the flowers or the whole plant[4]. Applied externally, it is used as a poultice on piles and can also be applied to the bath water[4]. The leaves are rubbed onto insect stings[222].

propta Seed - surface sow March/April in a greenhouse[134]. Do not allow the soil to dry out. Light aids germination. The seed usually germinates in 2 weeks at 20°C[134]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of soft wood early summer in a frame. Very easy[K]. Division in spring or autumn[200].

nwatta Landscape Uses:Border, Container, Massing, Seashore. Prefers a well-drained sweet soil and a sunny position[1]. Grows well on chalk[187]. Plants succeed in maritime gardens[233]. Hardy to about -15°C[200]. Another report says that it is hardy to about -25°C[187]. This species has formerly been cultivated as a dye plant[61], the var. 'Kel-away' is said to be the best form[169]. Plants are apt to over-flower and exhaust themselves. It is best to remove the flowering stems as soon as they stop flowering in order to stimulate the production of basal shoots for the following year[233]. Special Features:Attractive foliage, Fragrant foliage, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above, Fragrant flowers, Attractive flowers or blooms.

## 5.2.962 *Centaurea scabiosa*

Greater Knapweed

4 tin 8 cyuc 0 kcak 0 tcan 2 dwat 0.9 m hkuc htut cyutli hgatkyuctcup hwicli hysihrasjlutnyik hpa7tli flatprikwlisslip hpa7tmwatli fyfjxre7t hjonli

drutta *Centaurea scabiosa* is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known
tcanta None known

dwatta Diaphoretic Diuretic Tonic VulneraryThe roots and seeds are diaphoretic, diuretic, tonic and vulnerary[4]. The plant once had a very high reputation as an ingredient of the Medieval 'salve', an ointment applied to heal wounds and treat skin infections[4, 254].

propta Seed - sow early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. This should be done at least once every three years in order to maintain the vigour of the plant. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. Does well in the summer meadow[24]. An important nectar plant for bees and butterflies[24]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.963 Phlox stolonifera

Creeping phlox

4 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkuc
pcimhmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Phlox stolonifera is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta None Known

tcanta A good medium to high density groundcover that can be grown in semi-shade. Good for woodland gardening.
dwatta None known
propta Seed, division or by cuttings.

nwatta A long blooming mat forming perennial wildflower with showy flowers. Prefers bright shade with moist rich well drained soil. Plants tolerate acid or alkaline pH, drought, part sun and dry shade. Species self-seeds in optimum growing conditions. Spreads by stolons to form large colonies in the wild. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 5.2.964 Carex pensylvanica

Pennsylvania sedge

4 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkuc
pcimhmimhtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta *Carex pensylvanica* is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. The flowers are pollinated by Wind, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta Soil stabilizationCapable of colonizing disturbed sites [277]. Groundcover for dry shade. Underplanting for shade perennials. Lawn substitute for dry soils in shady areas (forms a turf that never needs mowing or mow 2-3 times per year to 2" tall). [368-1]. Provides cover for migratory fowl, sandhill cranes, and ducks (who also use the leaves for nesting material). It is also used by sharptail grouse and prairie chickens for nesting, cover, and dancing grounds [277]. Erosion Control. Ornamental: The leaves are soft and fine textured with an arching habit. It can be used as a lawn substitute [368-1]. Tolerant of mowing. Moderate salt tolerance.

dwatta None known

propta Plants spread by rhizomes. Plants may self-seed in optimum growing conditions. This species often does not grow well from seed.[368-1].

nwatta Easily grown in average, dry to medium, well-drained soils in part shade to full shade. Prefers loose loams in dry soils in sun-dappled part shade. Most sedges prefer moist to wet soils, but not this one. Plants spread by rhizomes. Plants may self-seed in optimum growing conditions[368-1]. Soil pH: 4.0 - 8.0. Drought: Tolerant. Flood: Moderate. Salt: Moderate. Soil Compaction: Intolerant. Mowing: Tolerant. Does not compete well with larger plants in full sun. Competes well in moderate to deep shade. Can form dense mats. Makes one of the earliest spring appearances of the Carices. Life Span:Long-Lived Perennial. Stand Persistence:Long. Form: Clump. [368-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. An evergreen. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

### 5.2.965 Pyrola asarifolia

Bog Wintergreen, Liverleaf wintergreen, Pink wintergreen
4 tlin 8 cyuc 0 kcak 0 tcan 1 dwat 0.3 m hkuc
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli fyifxre7t hjonli

drutta *Pyrola asarifolia* is an evergreen Perennial growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year; in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Plants can be used as a ground cover when spaced about 30cm apart each way[208]. They are somewhat slow to settle down though, and only form a good cover when they are growing luxuriantly[208].

dwatta Antirheumatic Haemostatic Hepatic Ophthalmic-This plant was considered to be an effective remedy in the treatment of rheumatism[207]. A decoction of the leaves, or the leaves and roots, has been used as an eyewash for sore eyes[257]. A decoction of the plant has been used to treat the coughing up of blood[257]. A decoction of the root has been used to treat liver complaints[257].

propta Seed - the only information we have on this species is that it is difficult from seed and germinates infre-

kcakta None known

tcanta A useful ground cover plant, though rather slow to spread[197]. Plants form clumps[208].

dwatta Antiseptic Astringent Styptic TonicThe root is astringent, styptic, tonic[61, 91, 218]. A safe and effective treatment for chronic bronchitis[218]. It is also used in the treatment of giddiness and general physical feebleness[61, 91]. Extracts of the plant are antiseptic[218]. The plant is a source of the drug bergenin[266].

propta Seed - surface sow in a greenhouse. Make sure that the compost does not dry out. Two weeks cold stratification can speed up germination which usually takes 1 - 6 months at 15°c[134]. Fresh seed, sown as soon as it is ripe in late spring is liable to germinate better than stored seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in late spring after flowering[188] or in autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in full sun or light shade in most soils[134, 200] but prefers a deep fertile soil that does not dry out fully[134]. Grows well in heavy clay soils. Plants are at their best in a medium-heavy soil[208]. Requires a position sheltered from cold drying winds and from the early morning sun. The leaf colour is best when plants are grown in a poor soil in a sunny position[188]. Plants are hardy to about -20°c[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants seem to be immune to the predations of rabbits[233]. The different species of this genus will hybridise freely when grown near each other[233].

### 5.2.1007 Phlox divaricata

Wild blue phlox

4 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.5 m hkuc
pcimhmimhtut cyutli hgattcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli hjonli

drutta Phlox divaricata is an evergreen Perennial growing to 0.5 m (1ft 8in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta None Known

tcanta Soil conditioner Soil stabilizationA medium density groundcover for shady areas especially with acid soils. Good for woodland gardening. Attractive to butterflies, clearing moths, and hummingbirds. As a long-lived perennial with fibrous roots it may be good for soil building and erosion control [318-1].

dwatta None known

propta Propagate by division in fall or spring. Propagate by basal cuttings in spring or propagate by root cuttings in early fall or winter.

nwatta Herbaceous perennial ephemeral wildflower with showy fragrant flowers. USDA Hardiness Zones: 4 - 9. Soil pH: 5.5 - 7.1. Growth Rate: Moderate. Life Span: Long-Lived Perennial. Stand Persistence: Medium. Form: Upright. Texture: Fine. Sun: bright shade, partial shade, shade. Soil Type: Loamy, Silty. Soil Moisture: Moderate. Minimum Root Depth: 14 inches (0.3m). Root Type: Fibrous Deep. Seasonal Interest: Spring. Flower Color: Blue, Pink, Purple, White. Flood: Sensitive. Salt: Intolerant. Soil Compaction: Moderate. Mowing: Intolerant. Fire Damage: Intolerant. Cold Injury: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Bloom Time: Spring - Early Summer. Plants tolerate clay loam, sand, acid or alkaline pH, heat, drought, part sun and dry shade. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Evergreen. The root pattern is fibrous dividing into a

large number of fine roots [1-2]. Royal Horticultural Society Award of Garden Merit

### 5.2.1008 Pulsatilla vulgaris

Pasque Flower, European pasqueflower

4 tlin 8 cyuc 0 kcak 0 tcan 3 dwat 0.2 m hkuc
htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprik-wisslip hpa7tmwatli fyifxre7t hjonli

drutta *Pulsatilla vulgaris* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta DyeA green dye is obtained from the flowers[238]. Plants can be grown to form a ground cover; they are best spaced about 30cm apart each way[208].

dwatta Alterative Antispasmodic Diaphoretic Diuretic Emmenagogue Expectorant Homeopathy Nervine Ophthalmic SedativePasque flower is considered by herbalists to be of highly valuable modern curative use as a herbal simple[4]. The plant contains the glycoside ranunculin, this is converted to anemonine when the plant is dried and is the medicinally active principle in the plant[268]. The whole plant is alterative, antispasmodic, diaphoretic, diuretic, emmenagogue, expectorant, nervine and sedative[4, 46, 165]. It is taken internally in the treatment of pre-menstrual syndrome, inflammations of the reproductive organs, tension headaches, neuralgia, insomnia, hyperactivity, bacterial skin infections, septicæmia, spasmodic coughs in asthma, whooping cough and bronchitis[238]. Externally, it is used to treat eye conditions such as diseases of the retina, senile cataract and glaucoma[244]. This remedy should be used with caution[165], excessive doses cause diarrhoea and vomiting[238]. It should not be prescribed to patients with colds[238]. See also the notes above on toxicity[165]. The plant is harvested soon after flowering, it is more poisonous when fresh and so should be carefully preserved by drying[4, 268]. It should not be stored for longer than 12 months before being used[4]. In homeopathy, the plant is considered to be specific in the treatment of measles[244]. It is also used for treating nettle rash, toothache, earache and bilious indigestion[244].

propta Seed - best sown as soon as it is ripe in early summer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°c. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame. Some care is needed since the plant resents root disturbance[200].

nwatta Requires a well-drained humus rich gritty soil in a sunny position[200]. Lime tolerant[1]. Prefers lime[187]. Grows best in a well-drained chalky soil in a dry warm situation[268]. Established plants are fairly drought tolerant[190]. A very hardy plant, tolerating temperatures down to about -20°c[187]. A very ornamental plant[1], there are many named varieties[187]. The plant has become rare in its natural environment, due partly to over-collecting and partly to habitat loss[238]. Large plants transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.1009 Coreopsis rosea

Pink tickseed

4 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.6 m hkuc
hmimhtut cyutli kyuctcuphja7n hwicli hrasjlut hpa7tli flatprik hpa7tmwatli hjonli

## 5.2.1002 Actaea spicata

Herb Christopher, Baneberry

4 1in 8 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc  
pcimhhm cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis  
hpa7tmwatli xre7t hjonli

drutta Actaea spicata is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

ckakta None known

tcanta Dye RepellentThe smell of the plant is reputed to drive away vermin[4]. A black dye is obtained from the berries when alum is used as a mordant[4, 13, 74, 100]. The seeds contain tannin[240].

dwatta Antidote Antispasmodic Cytostatic NervineThe root is antispasmodic, cytostatic, emetic, nervine and purgative[4, 17, 65, 240]. In Canada the root is used in the treatment of snakebite[211]. It is also considered useful in the treatment of nervous disorders and rheumatic fever[211]. In India it is used in the treatment of rheumatism, goitre and asthma[240]. This remedy should be used with some caution, see the notes above on toxicity.

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame or outdoors in a moist shaded seedbed[200]. The seed has a limited viability[200], it can also be sown in spring in a cold frame but germination rates may be poor. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in late spring or early summer of the following year. Division in March or October.

nwatta Succeeds in most conditions[233], but prefers a humus-rich moist soil in light shade doing well amongst shrubs and in light woods[1, 200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.1003 Waldsteinia ternata

Barren Strawberry

4 1in 8 cyuc 0 kcaak 3 tcan 0 dwat 0.2 m hkuc  
hmimhtut cyutli hgtaccup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli hjonli

drutta Waldsteinia ternata is an evergreen Perennial growing to 0.2 m (0ft 6in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It cannot tolerate atmospheric pollution.

ckakta None Known

tcanta Ground Cover. Food Forest, Accent: Good Texture/Form, Containers, Edging, Rabbit Resistant.

dwatta None Known

propta Propagate by division in early spring.

nwatta Herbaceous rhizomatous perennial. A dense mat of shiny dark green leaves similar to a strawberry plant. Saucer-shaped, bright yellow flowers. A very good low maintenance ground cover. Evergreen in mild winter regions. Tolerates light foot traffic. Easily divided in spring or early fall. Combines well with spring-blooming bulbs. Drought tolerant once established. Light: Partial Shade or Full Shade. Soil Type: Normal, Sandy or Clay. Soil pH: Neutral to Acid. Soil Moisture: Average or Moist. Dislikes heat and humidity. Growth Rate: Fast. Bloom Time: Early spring to summer.

## 5.2.1004 Waldsteinia fragarioides

Appalachian barren strawberry

4 1in 7 cyuc 0 kcaak 3 tcan 2 dwat 0.2 m hkuc  
pcimhhmhtut cyutli hgtakuyctucup hwicli hrasjlutnyikfrip  
hpa7tli flatprikhsom hpa7tmwatli hjonli

drutta Waldsteinia fragarioides is an evergreen Perennial growing to 0.2 m (0ft 6in) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The

flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils and can grow in saline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

ckakta None Known

tcanta Groundcover. A good medium to high density groundcover that will work in a dry or shady spot. Edging or Groundcover for the Perennial Border or Rock Garden. Woodland gardens. Andrenid bees (*Andrena* spp.) have been observed to visit the flowers for nectar and/or pollen; it is likely that other small bees and other small insects visit the flowers as well. It has been reported that White-tailed Deer avoid browsing on the foliage [1-6].

dwatta Native American ethnobotany: The Iroquois take a compound decoction of the plants as a blood remedy, and apply a poultice of the smashed plants to snakebites (Herick, JW, 1977, Iroquois Medical Botany, State University of New York, Albany, PhD Thesis).

propta Clump Division , Seeds.

nwatta An evergreen strawberry-like mat forming perennial wildflower. The fruit is neither fleshy nor edible at maturity. Prefers partial sunlight to light shade, more or less mesic (requiring a moderate amount of moisture) conditions, and soil containing rocky material, clay, loam, or humus. Will tolerate almost any well drained soil. The soil pH should be moderately acidic to neutral (5.5-7.0). This plant dislikes hot summer weather. Bloom Color: Yellow. Bloom Time: Apr to Jun. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 5.2.1005 Cirsium acaulon

Stemless Thistle

4 1in 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta Cirsium acaulon is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta None known

tcanta The seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

dwatta OdontalgicAt one time the root used to be chewed as a remedy for toothache[4].

propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°C.

nwatta An easily grown plant, succeeding in any ordinary garden soil in a sunny position[200]. This plant is very injurious in grassland, killing all plants that grow below it[4].

## 5.2.1006 Bergenia purpurascens

4 1in 8 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Bergenia purpurascens is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from March to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

quently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Pot up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary mycorrhiza. Division with great care in the spring[1, 111]. Pot up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. Requires a peaty or leafy acid soil that remains moist in the summer[200]. This is a very difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1]. This species is extremely rare and endangered in the wild[200].

## 5.2.966 Veronica arvensis

Corn Speedwell

4 1in 8 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta Veronica arvensis is a ANNUAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from March to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

ckakta None known

tcanta None known

dwatta Alterative Antiscorbatic DiureticThe herb is alterative, antiscorbatic and diuretic[240]. It is used in the treatment of scurvy, impurities of the blood etc[240]. It is also used as a remedy for scrofulous affections, especially of the skin, and is bruised and applied externally for healing burns, ulcers, whitlows and the mitigation of painful piles[240].

propta Seed - sow spring or autumn in situ.

nwatta Easily grown in a moderately fertile moisture retentive or dry well drained soil[200]. Prefers cool summers[200].

## 5.2.967 Limonium vulgare

Sea Lavender, Mediterranean sea lavender, Common Privet  
4 1in 7 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikhwishsom hpa7tmwatli fyifxre7t hjonli

drutta Limonium vulgare is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees, wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

ckakta None known

tcanta Repellent TanninThe plant repels moths[66]. The root is a source of tannin[46].

dwatta Decongestant DepurativeThe roots are decongestant and depurative[66]. They are used in the treatment of consumption with haemorrhage[257].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in

late spring or early summer, after the last expected frosts. Division in spring. Very difficult[200]. Root cuttings in late autumn or winter[200].

nwatta Landscape Uses:Border, Hedge, Screen, Superior hedge. Succeeds in light dry soils[1]. Tolerates maritime exposure[200]. A good bee plant[108]. Special Features: Not North American native, Invasive, Naturalizing, Attractive flowers or blooms.

## 5.2.968 Cypripedium calceolus parviflorum

Nerve Root

4 1in 8 cyuc 0 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Cypripedium calceolus parviflorum is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta None known

tcanta None known

dwatta Antidiarrhoeal Antispasmodic Diaphoretic Hypnotic Nervine Sedative TonicNerve root has a high reputation for its effect on the nervous system[238]. The root is a pungent bitter-sweet herb with an unpleasant odour, it is antispasmodic, diaphoretic, hypnotic, nervine, sedative, tonic[21, 46, 165, 192, 222, 238]. It is taken internally in the treatment of anxiety, nervous tension, insomnia, depression and tension headaches[238]. The active ingredients are not water soluble and so the root is best taken in the form of a tincture[222]. The plant is said to be the equivalent of Valerian (*Valeriana officinalis*) in its effect as a nervine and sedative, though it is less powerful[1, 4]. The roots are harvested in the autumn and are dried for later use[238]. In the interests of conservation, it is best not to use this herb unless you can be certain it was obtained from a cultivated source - see the notes above under cultivation details[K].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division with care in early spring, the plants resent disturbance[200]. Remove part of the original rootball with the soil intact[200]. Division is best carried out towards the end of the growing season, since food reserves are fairly evenly distributed through the rhizome[230]. Small divisions of a lead and two buds, or divisions from the back (older) part of the rhizome without any developed buds, establish quickly using this method[230]. Replant immediately in situ[230].

nwatta Succeeds in shade or full sun so long as there is adequate moisture[42]. Grows well in a woodland garden[230]. Plants are best grown on a north or north-west aspect in order to slow down early growth[1]. Requires a humus rich soil with plenty of moisture in the growing season[42], it also succeeds in chalky soils[200]. Must not be planted too deeply[42]. A very ornamental plant[1] it is long-lived when once established, though it is very difficult to establish a plant[233]. The flowers have a soft, rose-like perfume[245]. Plants are growing very well at the Savill Gardens in Windsor[233]. This plant is becoming very rare in the wild due to overcollecting for medicinal usage[238]. Reports that the plant is cultivated for its medicinal uses are largely spurious and, unless you can be certain that the root has come from a cultivated source, it is best not to use this plant

medicinally but to use suitable substitutes such as *Scutellaria laterifolia* and *Lavendula angustifolia*[238]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230].

## 5.2.969 Anemone cylindrica

Candle Anemone

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc hmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Anemone cylindrica* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta MiscellanyNone known

dwatta Antiseptic Miscellany Ophthalmic PoulticeThe root of this plant was one of the most highly esteemed medicines of the Omaha and Ponca Indians[213]. A wash of the pounded boiled root was applied externally to wounds[213]. The root contains anemoin, which is said to be a potent antiseptic[213]. A poultice made from the leaves is used to treat burns[207, 257]. A tea of the roots was used in the treatment of headaches and dizziness[213, 257]. A decoction of the stem and fruit is used as a wash for sore eyes[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Succeeds in ordinary garden soil but prefers a well-drained woodland soil and some shade[200]. Plants succeed in maritime gardens[233]. Hardy to at least -20°c[187]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. A good woodland plant[1, 187].

## 5.2.970 Pyrola rotundifolia

Round-Leaved Wintergreen

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc pcmhmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Pyrola rotundifolia* is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Plants can be used as a ground cover when spaced about 30cm apart each way[208]. They are somewhat slow to settle down though, and only form a good cover when they are growing luxuriantly[208].

dwatta Antirheumatic Antiseptic Antispasmodic Astringent Cardiotonic Contraceptive Diuretic Epilepsy Ophthalmic Skin Tonic UrinaryThe leaves are antirheumatic, antiseptic, antispasmodic, astringent, cardiotonic, contraceptive, diuretic, poultice, sedative and tonic[4, 9, 46, 172, 176,

218, 222]. A decoction is used in the treatment of skin diseases, as a gargle and a wash for the eyes[4]. It is used internally in the treatment of epilepsy and other nervous afflictions[4]. The leaves are harvested in mid to late summer and can be used fresh or dried[9]. The plant contains arbutin, a proven diuretic and antibacterial agent that is used as a urinary antiseptic, this hydrolyzes in the body into the toxic hydroquinone[222].

propta Seed - the only information we have on this species is that it is difficult from seed and germinates infrequently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Put up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary mycorrhiza. Division with great care in the spring[1, 111]. Put up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. Requires a peaty or leafy but not very acid soil that remains moist in the summer[31, 187]. Plants are hardy to at least -20°c[187]. This is a very ornamental[1] but difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1]. The flowers have a delicious almond-like fragrance[245].

## 5.2.971 Asarum europaeum

Asarabacca, European Wild Ginger

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.1 m hkuc pcmhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Asarum europaeum* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta DyeA vibrant apple-green dye is obtained from plant[7, 244]. A useful ground cover for a shady position so long as it is not dry[197], spreading by its roots[208].

dwatta Cathartic Diaphoretic Emetic Errhine Sternutatory Stimulant TonicAsarabacca has a long history of herbal use dating back at least to the time of the ancient Greeks, though it is little used in modern herbalism[268]. The root, leaves and stems are cathartic, diaphoretic, emetic, errhine, sternutatory, stimulant and tonic[4, 7, 9, 13, 21, 46, 240]. The plant has a strong peppery taste and smell[244]. It is used in the treatment of affections of the brain, eyes, throat and mouth[4, 19]. When taken as a snuff, it produces a copious flow of mucous[268]. The root is harvested in the spring and dried for later use[7]. Use with caution[21], see the notes above on toxicity. An essential oil in the root contains 50% asarone and is 65% more toxic than peppermint oil[240]. This essential oil is the emetic and expectorant principle of the plant and is of value in the treatment of digestive tract lesions, silicosis, dry pharyngeal and laryngeal catarrh etc[240].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring

## 5.2.999 Fritillaria sewerzowii

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli hgatkyuctup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Fritillaria sewerzowii* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from March to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta None known

dwatta AnaestheticAnaesthetic[123]. The plant contains an alkaloid that is a good local anaesthetic.

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta Prefers a well-drained loam that is kept dry in the summer[1, 90]. The soil must be kept quite firm[1]. Established plants are drought tolerant[190]. This species is best grown in a bulb frame, the light being left off (except in severe weather) whilst growth is in progress but then put on in the summer when growth dies down to ensure that the ground is baked[1]. Do not disturb the plants and only hand weed them[1].

## 5.2.1000 Gentiana straminea

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Gentiana straminea* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Analgesic Antiinflammatory Antipyretic Antirheumatic HypotensiveThe roots of gentian species contain some of the most bitter compounds known and make an excellent tonic for the whole digestive system, working especially on the stomach, liver and gall bladder[238]. The root is analgesic, anti-inflammatory, antipyretic, antirheumatic, diuretic, febrifuge, hypoglycaemic and hypotensive[176, 238]. The root is used internally in the treatment of arthritis, allergic inflammations, low-grade fever in chronic diseases, jaundice and hepatitis[176, 238]. The root is harvested in the autumn and dried for later use.

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°c for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°c will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will

prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This is an easily grown species[239]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. Plants are intolerant of root disturbance[200].

## 5.2.1001 Narcissus pseudonarcissus

Wild Daffodil, Daffodil

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Narcissus pseudonarcissus* is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta DyeA yellow to gold dye is obtained from the flowers[168].

dwatta Astringent Dysentery Emetic EpilepsyThe bulbs, leaves and flowers are astringent and powerfully emetic[4]. The bulb, especially, is narcotic and depresses the nervous system[4]. It has been used in the treatment of hysterical affections and even epilepsy with some effect[4]. The bulb is harvested in the winter and dried for later use[4]. The flowers are harvested in dry weather when they are fully open and should be dried quickly[4]. They are less powerful than the bulbs but are also considered to be antispasmodic and are useful in relieving the congestive bronchial catarrh of children and also useful in cases of epidemic dysentery[4].

propta Seed - best sown as soon as it is ripe in a cold frame. A short stratification will improve the germination of stored seed. Sow the seed thinly so that the seedlings can be left undisturbed in the pot for their first two years of growth. Give them an occasional liquid feed in the growing season to ensure they do not become nutrient deficient. When the plants become dormant in the summer, pot up the small bulbs placing 2 - 3 bulbs in each pot. Grow them on for another one or two years in the greenhouse before planting them out when they are dormant in late summer. Division of bulbs after the leaves die down in early summer[1]. Larger bulbs can be replanted immediately into their permanent positions, or can be stored in a cool place and then be planted out in the autumn. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in the autumn.

nwatta Prefers a deep rather stiff soil but succeeds in most soils[1]. Grows well in heavy clay soils. Succeeds in sun or shade[31]. Grows well on woodland edges[24]. The flowers have the sweet woodland perfume of the primrose[245]. This is not very discernible when only a few plants are grown, but is quite noticeable in a group of plants[245].

dwatta Cardiotonic Diuretic HypotensiveThe leaves or the whole herb is cardiotonic, diuretic and hypotensive[176, 218]. It is used in the treatment of hypertensive headache, dizziness, insomnia, irritability, oliguria and nephritic oedema[176]. It increases the renal blood flow and can be used for renal and cardiac oedema and ascites of liver cirrhosis[176].

propta Seed - best sown as soon as it is ripe in late summer and overwintered outdoors. The seed requires a period of cold stratification if it is to germinate well[238]. Prick out the seedlings when large enough to handle and grow them on in a cold frame for their first winter, planting out in late spring of the following year[K]. Division in spring just before active growth begins[200]. Plants can also be divided in the autumn[238].

nwatta Industrial Crop: Fiber Management: Hay Regional CropSucceeds in sun or shade in most well-drained but moisture-retentive soils[1, 200]. Plants can be invasive[200]. The flowers are attractive to bees.

## 5.2.996 Scutellaria galericulata

Common Skullcap, Marsh skullcap

4 tlin 8 cyuc 0 kcaak 0 tcan 3 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Scutellaria galericulata is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known tcanta None known

dwatta Antiinflammatory Antispasmodic Astrigent Epilepsy Febrifuge Nerve TonicThe herb is anti-inflammatory, antispasmodic, slightly astringent, febrifuge, nerve and strongly tonic[4, 9, 165]. In the home an infusion is sometimes used in the treatment of throat infections[9]. The plant is harvested in the summer as it comes into flower and can be dried for later use[9]. This plant is rarely if ever used in herbal medicine[9], though it is said to have the same applications as *S. lateriflora*[238]. These applications are:- Skullcap was traditionally used in the treatment of a wide-range of nervous conditions including epilepsy, insomnia, anxiety, delirium tremens, withdrawal from barbiturates and tranquilisers, and neuralgia[222, 238]. An infusion of the plant has been used to promote suppressed menstruation[213], it should not be given to pregnant women since it can induce a miscarriage[238]. This plant should be used with some caution since in excess it causes giddiness, stupor, confusion and twitching[238].

propta Seed - sow in situ outdoors in late spring. If there is only a small quantity of seed it is better to sow it in a pot in a cold frame in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the spring. Division in spring just before new growth begins. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Basal cuttings in early summer in a frame. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in a sunny position in any ordinary garden soil that does not dry out during the growing season[200].

## 5.2.997 Fritillaria roylei

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Fritillaria roylei* is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known tcanta None known

dwatta Antiasthmatic Antirheumatic Febrifuge Galactagogue Haemostatic Ophthalmic OxytoxicThe bulb is antiasthmatic, antirheumatic, febrifuge, galactagogue, haemostatic, ophthalmic and oxytoxic[46, 61, 178]. It is boiled with orange peel and used in the treatment of TB and asthma[240].

propta Seed - best sown as soon as ripe in a cold frame, it should germinate in the spring[1]. Protect from frost[134]. Stored seed should be sown as soon as possible and can take a year or more to germinate[134]. Sow the seed quite thinly to avoid the need to prick out the seedlings. Once they have germinated, give them an occasional liquid feed to ensure that they do not suffer mineral deficiency. Once they die down at the end of their second growing season, divide up the small bulbs, planting 2 - 3 to an 8cm deep pot. Grow them on for at least another year in light shade in the greenhouse before planting them out whilst dormant. Division of offsets in August[1]. The larger bulbs can be planted out direct into their permanent positions, but it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out in the autumn. Bulb scales[163].

nwatta This species is easily grown in a cold greenhouse but is difficult to grow outdoors in Britain[42]. In the wild it is under snow for 6 months of the year and is barked by the sun for the rest of the year[42]. Very closely related to and merging into *F. cirrhosa* in the eastern part of its range[90]. Famous in Chinese medicine, where it is called Pé-mou, it is sold as a medicinal herb in local markets there[42, 61]. Flowers are produced in 3 - 5 years from seed.

## 5.2.998 Verbena urticifolia

White Vervain

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyfjxre7t hjonli

drutta *Verbena urticifolia* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known tcanta MiscellanyNone known

dwatta Miscellany Restorative Women's complaintsA decoction of the root is given to babies to break out the hives[207]. The sweetened root decoction is drunk as an aid for flu[207]. An infusion of the root has been used in the treatment of profuse menstruation[257]. The root has been eaten to revive a patient and restore them to health[257].

propta Seed - sow early spring in a greenhouse or cold frame[1]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Basal cuttings in early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any moderately fertile well-drained but moisture retentive soil in a sunny position[1, 200]. Hardy to about -15°c[200].

or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Landscape Uses:Border, Ground cover, Massing, Rock garden, Woodland garden. Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Other reports say that this plant prefers a calcareous soil[13, 19, 268]. Plants are hardy to at least -15°c[200]. The flowers are malodorous and are pollinated by flies[200]. The root has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic. Plants often self-sow when growing in a suitable position[200]. This plant was at one time commonly cultivated as a medicinal herb[17]. Special Features: Attractive foliage, Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 5.2.972 Jeffersonia dubia

4 tlin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Jeffersonia dubia* is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta None known tcanta None known dwatta Cancer Febrifuge StomachicThe root is febrifuge and stomachic[218]. It also contains the anti-tumour compound berberine[218].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Sow stored seed as soon as possible in late winter or the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring[200].

nwatta Prefers a light sandy, peaty or humus-rich woodland soil and a rather shady situation[1, 130, 280]. Suitable for a choice position in a cool leafy soil[187]. This species is hardy to at least -20°c[187]. Plants have an extensive root system and resent disturbance[188]. They should be pot-grown and planted into their permanent positions as soon as possible. They should be pot-grown and planted into their permanent positions as soon as possible

## 5.2.973 Ranunculus flammula

Lesser Spearwort, Greater creeping spearwort

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyfjxre7t hjonli

drutta *Ranunculus flammula* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcaakta None known tcanta None known dwatta The whole plant is strongly rubefacient[4]. A tincture of the plant is used to cure ulcers[4].

propta Seed - sow spring in situ. This plant does not really need any encouragement. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta A plant of boggy soils and shallow water; it prefers a loamy soil and a sunny position. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 5.2.974 Phlox subulata

Mass phlox

4 tlin 9 cyuc 0 kcaak 3 tcan 0 dwat 0.1 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Phlox subulata* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known tcanta Soil conditioner Soil stabilizationA great high density groundcover. As a long-lived perennial with fibrous roots it may be good for soil building and erosion control [318-1].

dwatta None known propta Seed, division or by cuttings.

nwatta Herbaceous mat forming perennial wildflower. A very colourful, vigorous groundcover for full sun or partial shade. Poor soil tolerant. USDA Hardiness Zones: 4 - 9. Very hardy, tolerating temperatures down to -20 °C (-4 °F). Soil pH: 5.0 - 8.0. Soil Type: Sandy, Loamy. Soil Moisture: Moderate, Dry. Growth Rate: Moderate. Life Span: Long-Lived Perennial. Stand Persistence: Long. Form: Prostrate. Texture: Fine. Minimum Root Depth: 14 inches. Drought: Tolerant. Flood: Intolerant. Salt: Intolerant. Soil Compaction: Moderate. Fire Damage: Tolerant. Cold Injury: Infrequent. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Root Type: Fibrous Deep. Seasonal Interest: Spring. Used in borders, edgings, foundations and walls. Semi evergreen. Fruit Type: Capsule. Flower Color: Blue, Pink, purple, Red, White. Bloom Time: Spring - Late Spring. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Evergreen. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.2.975 Hyacinthoides nonscripta

Bluebell

4 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyikrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Hyacinthoides nonscripta* is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta None known tcanta Adhesive StarchA glue is obtained from the sap in the bulb and stem[4, 6, 66]. Simply cut open a bulb and apply the sap to whatever needs to be joined[K]. It makes an excellent paper glue, the join is stronger than the surrounding paper[6]. It would not work on non-absorbent materials such as plastics and glass[K]. A starch from the bulb has been used in laundering[4], it is very harsh on the skin[6].

dwatta Diuretic StypticThe bulb has diuretic and styptic properties[4]. It is used as a remedy for leucorrhoea[4].

propta Seed - sow early spring or as soon as ripe in a cold frame. It usually requires stratification. If you have plenty of seed it can be sown in situ, but it is usually more economical to sow it in a frame. If sown thinly, the seedlings can be left in their pots for the first year, though give them regular

liquid feeds to make sure that they get sufficient nutrient. Prick out the seedlings about 3 to a pot and grow on for 1 - 2 more years before planting out into their permanent positions when they are dormant[K]. Division of the bulbs in summer after the leaves die down. Larger bulbs can be replanted direct into their permanent positions, but it is best to pot up smaller bulbs and grow them on for a year in a cold frame before planting them out when dormant in late summer.

nwatta Easily grown in a soil rich in leafmold[90], preferring semi-shade[28, 31] but tolerating full sun. Succeeds in most soils but prefers a heavy one[200]. Succeeds in the dry shade of trees[188, 233]. Bulbs like to be quite deep in the soil[200]. The flowers diffuse a balsam-like scent in the sunshine[245].

## 5.2.976 *Antennaria dioica*

Catsfoot, Stoloniferous pussytoes

4 tin 8 cyuc 0 kcaak 2 tcan 2 dwat 0.1 m hkuc htut cyutli hgatyuctcup hwicli hyishras hpa7tli flatprikwiv hpa7tmwatli fyifnyanhjen hjonli

drutta *Antennaria dioica* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year; in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known

tcanta A good ground cover plant for sunny positions. Rather slow to spread, however, and it requires weeding for at least the first year[197]. Plants form a carpet and root as they spread[208].

dwatta Antitussive Astringent Chologogue Diuretic EmollientCatsfoot has been little used in herbal medicine though it was once used in mixtures for the treatment of bronchitis and bilious conditions[268]. The whole plant is antitussive, astringent, chologogue, discutient, diuretic and emollient[4, 7, 9, 21]. The plant is very rich in mucilage which makes it very valuable in the treatment of chest complaints[7]. It is also used in the treatment of liver and gall bladder complaints, hepatitis and diarrhoea[238]. Externally it is used as a gargle for treating tonsillitis and as a douche for vaginitis[238]. The herb is gathered in May before it comes into flower and can be dried for later use[7].

propta Seed - sow spring in cold frame and only just cover the seed. Do not allow the soil to dry out. The seed germinates in 1 -2 months at 15°C. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring of the following year[K]. Division in spring or autumn. Fairly easy, the divisions can be planted out direct into their permanent positions if required.

nwatta Prefers a light well-drained soil in full sun, succeeding in poor soils[1, 133, 200]. Established plants are drought tolerant[190]. This species is very susceptible to slug damage, the young growth in spring is particularly at risk[K]. Tolerates light treading[200]. The flowers are sometimes cut and used as 'everlasting flowers' since they dry well and keep their colour[7]. Plants are usually dioecious, male and female plants must be grown if seed is required. Some male plants have a few hermaphrodite flowers, though these are usually sterile. Apomictic flowers are also produced[17], these produce seed without sexual fertilization, each seedling being a clone of the parent plant. The plant is heat tolerant in zones 9 through 4. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree,

shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.977 *Zizia aptera*

Meadow zizia, Golden alexanders

4 tin 8 cyuc 0 kcaak 2 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli hgatyuctcup hwicli hrasjlutnyik hpa7tli flatprikwiv hpa7tmwatli hjonli

drutta *Zizia aptera* is an evergreen Perennial growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known

tcanta Nectary: provides nectar or pollen for beneficial insects [1-2]. The flowers attract butterflies and seed heads attract birds. Various kinds of insects visit the flowers primarily for nectar, especially small bees (Halictid, Andrenid, Nomadine) and flies (Chloropid, Tachinid, Muscid, Syrphid, etc.), as well as occasional beetles and plant bugs. The bees collect pollen as well, while some flies and beetles may feed on pollen. The caterpillars of *Papilio polyxenes asterias* (Black Swallowtail butterfly) feed on the foliage of this and other members of the Carrot family [1-6]. Suitable for the wild garden and other informal plantings as well as collections of native wild flowers[200]. Cut Flower. Water Purifier: Used in raingarden plantings [318-1].

dwatta The presence of secondary compounds such as apterin may contribute to the potential medicinal value of *Zizia* species. *Zizia aurea* roots have been used by Native Americans as a tea to cure fevers, and the plant has been referred to as a vulnerary (wound-healing) agent [318-1].

propta Seed - we have no information for this species but it is probably best sown in spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta An upright short-lived tap-rooted perennial wildflower in the Carrot (Apiaceae) family. Prefers sun or part sun with moist or dry soil. Plants tolerate clay loam, rocky or gravelly soil, alkaline pH and controlled burns. Drought Tolerant. Bloom Time: May to July. Bloom Description: Showy, Yellow. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 5.2.978 *Chamaelirium luteum*

Blazing Star - Unicorn Root - Devil's Bit, Fairywand

4 tin 8 cyuc 0 kcaak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta *Chamaelirium luteum* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Adaptogen Diuretic Emetic Tonic Uterine tonic VermifugeBlazing star is a traditional remedy of the North American Indians where it was used mainly as a woman's herb[254]. It is widely used in Western herbal medicine

dwatta Miscellany ParasiticideOne report says that the roots are used medicinally, but gives no further details[240].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°C[200]. Temperatures above 15°C inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Prefers a rich well-drained soil that stays moist in the summer[111, 187]. Dislikes water-logged soils[200], it is liable to die out in heavy soils over winter[111]. Requires an open sunny position[188]. Plants are generally hardy to about -20°C[187]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Grows well in the rock garden[188]. This species is closely related to *C. brunonianum*[200].

## 5.2.993 *Gentiana triflora*

4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Gentiana triflora* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Antibacterial Eczema Stomachic UrinaryGentian roots contain some of the most bitter compounds known and make an excellent tonic for the digestive system, working especially on the stomach, liver and gall bladder[238]. The root is antibacterial and stomachic[176]. It is used in the treatment of jaundice, leucorrhoea, eczema, conjunctivitis, sore throat, acute infection of the urinary system, hypertension with dizziness and tinnitus[176]. The root is harvested in the autumn and dried for later use.

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species requires a lime-free, peaty, moist

but well-drained soil in sun or partial shade[187, 239]. Plants are hardy to about -20°C[187].

## 5.2.994 *Pyrola chlorantha*

Green-Flowered Wintergreen

4 tin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc pimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli fyifxre7t hjonli

drutta *Pyrola chlorantha* is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year; in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta AstringentThe plant is astringent. It has been used in the treatment of menorrhagia, diarrhoea and haemorrhages[155]. It has also been used to treat bloody diarrhoea in children[257].

propta Seed - the only information we have on this species is that it is difficult from seed and germinates infrequently[200]. We would suggest sowing the seed as soon as it is ripe if this is possible. Sow it into soil collected from around an established plant, only just covering the seed, and put the pot in a shady part of a cold frame. Pot up any young seedlings as soon as they are large enough to handle, once again using soil from around an established plant. Plant out into their permanent positions when the plants are large enough. You should not need to use soil from around an established plant to do this since the soil in the pot will contain the necessary micorrhiza. Division with great care in the spring[1, 111]. Pot up the divisions using some soil from around an established plant, grow on in a lightly shaded part of a greenhouse or frame and do not plant out until the plants are growing away vigorously[200].

nwatta Prefers a moist sandy woodland soil[111, 200] in a cool position with partial shade[1, 11, 200]. Requires a peaty or leafy acid soil that remains moist in the summer[200]. This is a very difficult plant to grow. It requires a mycorrhizal relationship in the soil and therefore needs to be grown initially in soil collected from around an established plant[200]. It is also very difficult from seed as well as being intolerant of root disturbance which makes division difficult[1]. This species is extremely rare and endangered in the wild[200].

## 5.2.995 *Apocynum venetum*

4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwiv hpa7tmwatli xre7t hjonli

drutta *Apocynum venetum* is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta FibreThe bark yields a fibre that is used for making twine, bags, linen etc[46, 61]. It can be harvested after the leaves fall in autumn but is probably at its best as the seed pods are forming[169]. The dogbane-milkweed family *Asclepias*, *Apocynum*, *Calotropis*, and *Trachomitum* spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed fiber or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agroforestry systems rather than as monocultures [1-1].



## 5.2.989 *Uvularia grandiflora*

Fairybells, Merry Bells, Bellwort, Largeflower bellwort  
4 tin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Uvularia grandiflora* is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Analgesic Poultice SalveThe root is analgesic[257]. It is used as a poultice or salve in the treatment of toothaches, boils, swellings, wounds and ulcers[222, 257]. As I was typing this report (29/01/95), Geoffrey Smith on Radio 4's 'Gardeners Question Time' spoke about it and said that it was the best poultice for boils that he knew of[K]. An infusion of the root has been used to treat backaches and, mixed with oil, has been used as a salve on sore muscles[257]. A tea made from the roots is used as a wash in the treatment of rheumatic pains[222].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[200]. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division after the plants die down in late summer. It is best carried out in early spring before the plants flower[188]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Landscape Uses:Container, Foundation, Specimen, Woodland garden. An easily grown plant, it requires a cool moist shady position and a light sandy soil[1, 42, 111]. Likes plenty of humus in the soil[111]. Grows well in a woodland garden and in the rock garden[200]. Plants grow much taller in rich soils and then succeed in the herbaceous border[222]. A very hardy plant, tolerating temperatures down to about -20°c[187]. A very ornamental species, there are some named varieties[233]. Special Features:North American native, Naturalizing, Attracts butterflies.

## 5.2.990 *Tephrosia virginiana*

Catgut, Virginia tephrosia

4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc

htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Tephrosia virginiana* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Hair InsecticideThe root is a source of the insecticide 'rotenone'[207, 213]. This is especially effective against flying insects but appears to be relatively harmless to animals[213]. A decoction of the roots has been used as a hair shampoo by women in order to prevent hair loss[257].

dwatta Anthelmintic Cancer Diaphoretic Diuretic Pectoral Tonic Women's complaintsThe root is anthelmintic, diaphoretic, diuretic, pectoral and tonic[207, 222, 257]. A tea made from the roots is said to make children muscular and strong[222, 257]. A cold tea is used to improve male potency and also to treat TB, bladder problems, coughs, irregular menstruation and other women's complaints[222, 257]. Experimentally, the root has shown both anticancer and cancer-

causing activity[222]. The leaves have been placed in the shoes in order to treat fevers and rheumatism[257].

propta Pre-soak the seed for 12 hours in warm water and then sow in a greenhouse in spring. Prick out the seedlings into individual pots when they are large enough to handle and grow on in the greenhouse for their first winter, planting out in the following spring or early summer.

nwatta Industrial Crop: Pesticide Management: Hay Wild CropA deep rooted plant, requiring a dry to moist light or medium very well-drained soil in a sunny position[200]. Plants are hardy to about -25° when given a suitable position[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 5.2.991 *Delphinium nuttallianum*

Larkspur, Twolobe larkspur

4 tin 8 cyuc 0 kcaak 2 tcan 0 dwat 0.3 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Delphinium nuttallianum* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Dye Ink ParasiticideA blue dye is obtained from the flowers[207, 257]. An ink can be made from the dye[207]. A parasiticide is obtained from the leaves[172]. It is quite toxic and so is for external use only.

dwatta ParasiticideNone known

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°c[200]. Temperatures above 15°c inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°c[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Prefers a rich well-drained soil[111, 200]. Dislikes water-logged soils[200]. Requires an open sunny position[188]. A very variable species, there are several subspecies[61]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Slugs and snails are very attracted to this plant[200].

## 5.2.992 *Delphinium cashmerianum*

4 tin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Delphinium cashmerianum* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known

tcanta Miscellany Oil ParasiticideThe following uses are for the closely related *D. brunonianum*. They probably also apply for this species:- A parasiticide is obtained from the leaves[51, 61]. It is quite toxic and so is for external use only. In the Himalayas it is only used to destroy ticks on animals[51, 240]. The seed contains 30% of an oil that has industrial uses[91]. The seed is very small, however, and it would require a large area of plants to obtain reasonable yields.

where it is seen as a balancing herb for the female reproductive system and has proved to be a beneficial remedy for menstrual problems and ovarian cysts - it can also be of help in the menopause[254]. The root is adaptogen, diuretic, emetic, uterine tonic and vermifuge[4, 46, 61, 105, 238]. Small doses of the dried and powdered root are used[222]. It is employed in the treatment of amenorrhoea, dysmenorrhoea and leucorrhoea[207] and also for a variety of ailments associated with the male and female reproductive organs[222]. It should be used with caution since an excess causes vomiting[238]. The root is harvested in the autumn and dried for later use[238].

propta Seed - sow as soon as it is ripe just below the surface of a peat/sand mix in pots in a cold frame[164]. Keep cool and moist. Germination usually takes place within 1 - 6 months at 10°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in pots plunged in a nursery bed for 1 - 2 years, giving protection from severe weather. Plant out in spring when the plants are large enough[164]. Division.

nwatta Requires a moist fertile humus-rich acidic soil in sun or light dappled shade[1, 200]. Prefers a cool peaty soil[233]. Plants are dioecious, male and female plants must be grown if seed is required[270].

## 5.2.979 *Erigeron pulchellus*

Robin's plantain, blue spring daisy, hairy fleabane

4 tin 8 cyuc 0 kcaak 3 tcan 0 dwat 0.6 m hkuc

pcimhmim cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Erigeron pulchellus* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Bees, Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None Known

tcanta Ground Cover. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. Locations: Cottage gardens, butterfly gardens, native plant/wildflower gardens, meadows or naturalized areas. May be used in borders and rock gardens [368-1].

dwatta None known

propta Propagate by seed, division or cuttings. Seeds: sow outside in late fall or the following spring without any cold treatment. Poor germination. Seeds require light for germination. Division - very good. Will naturalize in optimum growing conditions by self-seeding and stoloniferous spread.

nwatta A perennial herbaceous wildflower. Dry to medium, well-drained soils in full sun. Tolerates light shade, heat and humidity. Good drainage is very important. Best in poor to modest soils which have not been fertilized. Plants usually perform poorly in rich soils. [368-1]. Will naturalize in optimum growing conditions by self-seeding and stoloniferous spread. Flowers: Showy. Flower Color: White. Flower Time: Late spring or early summer. No serious insect or disease problems. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growing habit is a clumper with limited spread [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 5.2.980 *Helichrysum arenarium*

Everlasting Flower

4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc

htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Helichrysum arenarium* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH:

mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Chologogue Diuretic Homeopathy Skin StomachicThe fresh or dried flowers, or the entire flowering herb, are chologogue, diuretic, skin and stomachic[9, 46, 61]. An infusion is used in the treatment of gall bladder disorders and as a diuretic in treating rheumatism, cystitis etc[9]. A homeopathic remedy is made from the flowering plant[9]. It is used in the treatment of gall bladder disorders and lumbago[9].

propta Seed - sow February/March in a greenhouse. The seed usually germinates in 2 - 3 weeks at 20°c. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Requires a well-drained, sunny sheltered position[1, 200]. Often cultivated for its flowers which are extensively used as a decoration and in wreaths etc[1]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 5.2.981 *Asplenium scolopendrium*

Hart's Tongue Fern

4 tin 8 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc

pcimhmim cyutli kyuctcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwsslip hpa7tmwatli hjonli

drutta *Asplenium scolopendrium* is an evergreen Fern growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, and the seeds ripen from July to August. Suitable for: light (sandy) and medium (loamy) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta None known

tcanta CosmeticA good ground cover plant for shady positions[28, 200], so long as it is planted no more than 30cm apart each way[208]. Plants form a slowly spreading clump[208]. A decoction of the fronds is used cosmetically as a hair wash to counteract greasy skin and also as a face pack for delicate skin[7].

dwatta Astringent Chologogue Diaphoretic Diuretic Dysentery Expectoant VulneryThe fronds are astringent, chologogue, diaphoretic, diuretic, expectoant, vulnery[4, 7, 9, 165]. Externally it is used as an ointment in the treatment of piles, burns and scalds[4]. An infusion is taken internally for the treatment of diarrhoea, dysentery, gravelly deposits of the bladder and for removing obstructions of the liver and spleen[4]. The fronds are harvested during the summer and can be dried for later use[7].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. The spores usually germinate in the spring[1]. Spring sown spores germinate in 1 - 3 months at 15°c[134]. Pot on small clumps of plantlets as soon as they are large enough to handle and grow them on in light shade in a greenhouse. Keep the plants humid until they are well established. Once the plants are 15cm or more tall, plant them out into their permanent positions in the spring. Division in spring. Leaf bases - dig up the plant and wash off the soil until the old caudex covered with 'dead' leaf bases can be clearly seen. Strip off these bases individually by peeling them down the caudex. At the point of attachment they will be green. Young plants can be raised by planting these leaf bases, green tip up, in a pot of loam-based compost and enclosing the pot in a plastic bag. Within one month green swellings will appear around the original point of attachment to the caudex, each of these will develop quite quickly into a young fern. It takes 3 months in summer but longer in winter[200].

nwatta Easily grown in a shady position in a soil that is rich in leaf-mould[187]. Prefers a light sandy soil[1]. Succeeds on chalk[28]. Plants can be grown on drystone walls[219]. Grows well in heavy clay soils. Prefers a shady

position with no more than 3 hours sunlight a day, greater exposure will cause yellowing and burning of the leaves[187]. One report says that it succeeds in dry shade[188]. Requires a pH of 6 or more in order to flourish. Plants are hardy to about -30°c[187], they grow very well in SW England[31]. A very adaptable plant[28]. There are many named forms, selected for their ornamental value[187, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 5.2.982 Linaria canadensis

Blue Toadflax

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 0.6 m hkcuc htuc cyutli hgatkuyctcup hwicli hyishrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Linaria canadensis is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.
kcakta None known
tcanta None known
dwatta Antiahaemorrhoidal Diuretic LaxativeThe leaves are antiaemorrhoidal, diuretic and laxative[61, 254]. They are applied externally in the treatment of haemorrhoids[254].

propta Seed - sow spring in situ[200]. An autumn sowing can also be made in areas with mild winters[200]. This sowing will produce larger plants.

nwatta A very drought resistant plant once established, it thrives in a poor gravelly soil[200]. Nitrogen-rich soils produce excessive leaf growth at the expense of flowering[200]. Prefers a sunny position[200].

### 5.2.983 Limonium carolinianum

Sea Lavender; Lavender thrift

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 0.6 m hkcuc htuc cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatpriklwish-som hpa7tmwatli fyifxre7t hjonli

drutta Limonium carolinianum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known
tcanta None known
dwatta Astringent DysenteryThe roots contain tannin and are powerfully astringent[4, 207]. A decoction of the root has long been used as a popular domestic remedy for diarrhoea, dysentery etc and are also used to treat sore mouths, cankers etc[4, 207]. The dried and powdered root is applied to old ulcers or piles[4].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very difficult[200].

nwatta Requires a well drained soil and a sunny position[200]. Plants are well-suited to coastal gardens and dry soils[200]. Hardy to about -20°c[200].

### 5.2.984 Anemone virginiana

Tall Thimbleweed

4 tin 8 cyuc 0 kcak 0 tcan 1 dwat 0.6 m hkcuc pcmhmmim cyutli hgattcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Anemone virginiana is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in July. The species is hermaphrodite

(has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta None known
tcanta None known
dwatta Astringent Emetic Expectoant PoutliceThe root and seeds are astringent, emetic and expectoant[222]. A decoction of the roots was used in the treatment of TB, whooping cough and diarrhoea[222, 257]. The root is pulverised and used as a wet poultice in the treatment of boils[213, 222, 257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 20°c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first year in a lightly shaded place in a greenhouse. When large enough, plant them out into their permanent positions in the spring. Division in late summer after the plant dies down.

nwatta Succeeds in ordinary garden soil but prefers a moist well-drained woodland soil[1, 200]. Prefers a moist peaty soil in some shade[187]. Tolerates drought during its summer dormancy[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 5.2.985 Paeonia caucasica

4 tinl 8 cyuc 0 kcak 0 tcan 1 dwat 0.6 m hkcuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Paeonia caucasica is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known
tcanta Beads Dye OilA red dye is obtained from the flowers[74]. It has been used to dye cloth and paper[250]. A fatty oil is obtained from the seed[74, 250]. No uses of the oil are given[K]. The seeds are used as beads in necklaces etc[74, 250].

dwatta AntitussiveA tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower; it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1, 200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too

dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. This species is not recognized by many botanists, who view it as no more than a synonym of *P. mascula*[250]. A long-lived plant, specimens can survive in the garden for at least 50 years[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1].

### 5.2.986 Dryopteris cristata

Crested Wood Fern

4 tin 8 cyuc 0 kcak 0 tcan 4 dwat 0.5 m hkcuc hmim cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Dryopteris cristata is an evergreen Fern growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta None known
tcanta None known
dwatta Diaphoretic Expectoant Febrifuge VermifugeThe male fern is one of the most popular and effective treatments for tapeworms. The root stalks are anodyne, antibacterial, anti-inflammatory, antiviral, astringent, expectoant, febrifuge, sudorific, vermifuge and vulnerary[218, 222, 238]. The root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent[238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is also taken internally in the treatment of internal haemorrhage, uterine bleeding, mumps and feverish illnesses[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. Externally, the root is used in the treatment of abscesses, boils, carbuncles and sores[238].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°c. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position. Succeeds in full sun but grows best in a shady position with only 2 - 3 hours sun per day[200]. Tolerates a pH range from 4.5 to 7[200]. Dislikes heavy clay. Prefers a good supply of water at its roots but succeeds in dry shade and tolerates drought when it is established. A very hardy plant, tolerating temperatures down to about -30°c[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Hybridizes in the wild with several other species[187].

### 5.2.987 Polemonium reptans

Abcess Root, Greek valerian

4 tin 8 cyuc 0 kcak 0 tcan 2 dwat 0.3 m hkcuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Polemonium reptans is a PERENNIAL growing to 0.3 m (1ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta HairA decoction of the whole plant is used as a hair rinse[213].

dwatta Alternative Astringent Diaphoretic Expectoant PectoralThe dried roots have a slightly bitter and acrid taste[4]. They are alternative, astringent, diaphoretic, expectoant and pectoral[4, 61, 222, 238]. They can be used in an infusion with water or as a tincture with alcohol[4]. They are used internally in the treatment of coughs, colds, bronchitis, laryngitis, tuberculosis, feverish and inflammatory diseases, including skin conditions and poisonous bites[238]. The root is rarely used in modern herbalism[238]. It is harvested in the autumn and dried for later use[238].

propta Seed - sow spring in a cold frame[14]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring or early autumn[111]. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a moist well-drained fertile soil in sun or semi-shade[200]. Plants are best grown in a soil approaching that of a moraine and they must not be allowed to dry out in the summer[1]. Plants are hardy to about -20°c[187]. A number of named varieties have been selected for their ornamental value[187]. Plants have a creeping root and can multiply very quickly[4]. They can also self-sow to the point of nuisance[200]. The plants have a smell that attracts cats. The cats roll in the plants with evident pleasure and can cause considerable damage to young plants and ones that have recently been moved[238, K].

## 5.2.988 Woodwardia areolata

Netted chain fern

4 tin 9 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkcuc hmim cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Woodwardia areolata is a deciduous Fern growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta None Known

tcanta Groundcover. A medium to high density ground-cover that will work in a wet and shady spot. Garden Uses: Shade gardens, native plant gardens, woodland gardens or naturalized areas. Also effective along streams and ponds [368-1]. Provides shelter for frogs, toads, newts.

dwatta None known

propta Propagate by spores or rhizome division.

nwatta A deciduous, perennial, colony-forming, waxy green, deciduous fern. Prefers organically rich, medium to wet, well-drained soils in part shade to full shade. Does well in average garden soils and will take considerable sun as long as soils are kept consistently moist[368-1]. Soil pH: Acidic (pH<6.8). Typically occurs in woodland swamps and bogs. Bloom Time: Non-flowering. Bloom Description: Non-flowering. Can be mistaken for Onoclea sensibilis. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

hardy to UK zone 6 and is not frost tender. It is in flower from May to June, and the seeds ripen in November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The ovoid fruit is very small, about 10mm x 7mm, and hairless when fully ripe[198, 200, 266]. It contains a number of small seeds, but these are easily eaten with the fruit[K].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°c, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. Young spring growth is susceptible to frost damage[160]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. This is a climbing plant, supporting itself by twining around branches etc[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.101 Celtis australis

Nettle Tree, European hackberry

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 20 m hkuc

htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Celtis australis is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Oil OilFruit - raw[3, 7, 100]. A mealy pleasant taste[74]. Small and insipidly sweet[2, 183]. Of little value[177]. The fruit is about 10mm in diameter[200] with a single large seed[K]. Seed - raw or cooked[7, 46, 61, 105]. An oil is obtained from the seed[7, 105].

tcanta Dye Fuel Oil Oil WoodA yellow dye is obtained from the bark[100]. A fatty oil is obtained from the seed[243]. No more information is given. Wood - very tough, pliable, durable[46, 61, 158]. Widely used by turners[7]. Used for the handles of agricultural implements[272]. The flexible thin shoots are used as walking sticks[61]. An excellent fuel[146].

dwatta Astringent Dysentery Lenitive StomachicThe leaves and fruit are astringent, lenitive and stomachic[7, 254]. The leaves are gathered in early summer and dried for later use[7]. The fruit, particularly before it is fully ripe, is considered to be more effective medicinally[254]. A decoction of both leaves and fruit is used in the treatment of amenorrhoea, heavy menstrual and intermenstrual bleeding and colic[218, 240]. The decoction can also be used to as-

tringe the mucous membranes in the treatment of diarrhoea, dysentery and peptic ulcers[254].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. The trees have deep spreading roots[7] and are very drought resistant once established[74, 200]. This species requires mild winters if it is to succeed[3]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. A hardier form, from seed collected in the Caucasus, is in cultivation in Britain[11]. The fruit and the seed are sometimes sold in local markets in the Balkans[46, 183]. This plant is said to be the lotus fruit of the ancients[183]. It is mentioned in the story of Odysseus returning from Troy and the story relates that if a person should eat the fruit they will never leave that area. Coppices well[146]. A good shade tree[200]. Trees can be very long-lived, perhaps to 1000 years[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.102 Sorbus thibetica

Tibetan whitebeam

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 20 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sorbus thibetica is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Very nice raw when it is fully ripe, preferably picked after a frost[K]. At this stage it has a mealy texture and a mild-flavoured slightly sweet fruit. The fruit can also be bletted. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit. The fruit is up to 15mm across[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. Closely related to *S. cuspidata*[11]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants

mixed with water they produce a good lather which is an effective and gentle soap[168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°c[138, 200]. Germination usually takes place in 1 - 2 months at 20°c[138]. One report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°c for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°c it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. This is a garden hybrid and it will not breed true from seed. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. Some of the cultivars included here are tolerant of clay soils[260]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

## 6.1.37 Lespedeza formosa

Oriental lespedeza

tfo2n 5 tlin 9 cyuc 0 kcaak 3 tcan 0 dwat 2 m hkuc

htut cyutli hgatkuy hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lespedeza formosa is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta BroomThe twigs are used in making brooms[151].

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow it in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in individual pots in a frame. It can be difficult to get the cuttings through their first winter, it is best to plunge the pots in a bed of ashes in a sheltered border outdoors[78].

nwatta Easily grown in a light loam in full sun[1]. The top growth is not very cold tolerant, although the rootstock is considerably hardier. Plants are usually cut back to the

ground in all but very mild winters, though they generally sprout well from the base in the following spring and flower in late summer[182]. A very ornamental plant[1]. This species is extremely variable in the shape of leaflets, size of flowers and split-length of calyx. However, these characters are continuous and overlapping, without a clearly defined concept and cannot be used to distinguish different species or infraspecies[266]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.38 Gleditsia macracantha

tfo2n 5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat m hkuc htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gleditsia macracantha is a deciduous Tree growing to 18 m (59ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta None known

tcanta SoapA soap substitute is obtained from the seedpods[46, 61, 109]. Wood - strong, durable, coarse-grained[82].

dwatta AnaestheticThe twigs and the leaves contain the alkaloids gleditsichine and stencarpine[4]. Stencarpine has been used as a local anaesthetic whilst gleditsichine causes stupor and loss of reflex activity[4].

propta Seed - pre-soak for 24 hours in warm water and then sow in spring in a greenhouse[78]. The seed should have swollen up, in which case it can be sown, if it has not swollen then soak it for another 24 hours in warm water. If this does not work then file away some of the seed coat but be careful not to damage the embryo[78]. Further soaking should then cause the seed to swell. One it has swollen, the seed should germinate within 2 - 4 weeks at 20°c. As soon as they are large enough to handle, prick the seedlings out into individual deep pots and plant them out into their permanent positions in the summer. Give the plants some protection from the cold for their first few winters outdoors.

nwatta Easily grown in a loamy soil, requiring a sunny position[11]. Succeeds in most soils[200] including sandy ones[188]. Tolerates drought once established[1] and atmospheric pollution[200]. Rather tender when young, it grows best in S. Britain[11]. Trees have a light canopy, they come into leaf late in the spring and drop their leaves in early autumn[200] making them an excellent top storey tree in a woodland garden. The flowers have a delightful vanilla fragrance[245]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.39 Coronilla emerus

Scorpion Senna

tfo2n 5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 2.7 m hkuc

htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Coronilla emerus is an evergreen Shrub growing to 2.7 m (8ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known  
tcanta None known  
dwatta Cardiac DiureticThe plant is cardiac and diuretic[61].

propta Seed - scarify and then pre-soak the seed for 1 - 2 hours in warm water[164]. A period of cold stratification is also said to be helpful[200]. Sow the seed in spring in a greenhouse. Germination usually takes place in 4 - 6 weeks at 15°c[164]. Pot up the seedlings as soon as possible into individual pots and plant them out in the following spring[164]. Cuttings of greenwood, June in a frame with bottom heat[11]. Cuttings of half-ripe wood, July/August in a frame[11]. Cuttings of nearly mature side shoots, firm at the base and 7 - 10cm long with a heel, October/November in a frame. Plants are well rooted after 12 months. Good percentage[78].

nwatta Succeeds in a sunny position in most well-drained soils[184], preferring a moderately rich loamy soil[11, 182, 200]. An easily grown plant[11], it is hardy to about -20°c[184] if it is sheltered from cold winds[200]. Plants can be pruned almost back to the base if required, they usually resprout freely[200]. The flowers are sweetly scented[245]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.1.40 Colutea x media

tfo2n 5 tlin 9 cyuc 0 kcak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli hqatkyuctcup hwicli hyishrasjltutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Colutea x media is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta Hedge Hedge Soil stabilizationThis species has an extensive root system and is useful for planting on dry sunny banks for stabilizing the soil[200]. Plants can be grown as a hedge[200].

dwatta None known  
propta Seed - pre-soak for 24 hours in hot water and sow late winter in a greenhouse[113]. Scarification can help speed up the germination process[164]. Germination can be slow and erratic[200], though treated seed usually germinates in 1 - 3 months at 20°c[164]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. This species is a hybrid and so is unlikely to breed true from seed. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings are not very long-lived[78].

nwatta Requires a well-drained soil and a sunny sheltered position[182, 200]. Succeeds in poor and in dry soils, growing well on sunny banks[182]. Tolerates atmospheric pollution and salt-laden winds[200]. Plants are hardy to about -20°c[200]. Flowers are produced on the current year's growth[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.41 Centrosema virginianum

Butterfly Pea, Spurred butterfly pea  
tfo2n 5 tlin 9 cyuc 0 kcak 0 tcan 0 dwat 2 m hkuc  
htut cyutli hqatkyuctcup hwicli hyishrasjltut hpa7tli frusflat-prikliwis hpa7tmwatli xre7t hjonli

drutta Centrosema virginianum is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known  
tcanta Green manure Soil stabilizationThe plant can be allowed to grow without supports and it will then sprawl over the ground as an effective ground cover[200]. Plants have been grown as a green manure[200]. The plants extensive root system makes it useful for stabilizing soils and controlling erosion[200].

dwatta None known  
propta Seed - pre-soak for 12 hours in warm water and sow in a greenhouse in the spring. Prick out the seedlings into individual pots once they are large enough to handle and plant out in the summer.

nwatta Succeeds in any sandy or loamy soil in a sunny position[200]. Tolerant of poor acid soils, dry soils and drought[200]. A climbing plant, supporting itself by twining around other plants[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 6.1.42 Indigofera kirilowii

Kirilow's indigo, Indigo  
tfo2n 5 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjltut hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta Indigofera kirilowii is a deciduous Shrub growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta OphthalmicOphthalmic[151].

propta Pre-soak the seed for 12 hours in warm water and sow February in a warm greenhouse. The germination can be variable. Prick out the seedlings when large enough to handle and overwinter the young plants in a greenhouse for the first winter, planting out in late spring or early summer after the last expected frosts[78]. Cuttings of half-ripe wood, 5 - 8cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Overwinter the young plants in a greenhouse for the first winter and plant out in late spring or early summer[11]. Root cuttings 3cm long in December. Good percentage[78]. Suckers. Remove them in the dormant season, preferably towards the end of winter, and plant out into their permanent positions.

nwatta Landscape Uses:Border, Erosion control, Ground cover, Massing, Rock garden, Specimen. Requires a light or medium well-drained soil and a sunny position[11, 200]. Succeeds on chalk[11]. The rootstock is hardy to about -20°c[200] and plants resprout from the base if they are cut back by winter cold. Plants are only sometimes cut to the ground in the winter[11]. They flower on the current years growth[184] and flower more freely if they are pruned to the ground during the winter. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Attracts butterflies, Attractive flowers or blooms.

drutta Vitis monticola is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[1, 2, 105]. Large, thin-skinned with a tender juicy sweet pulp[183]. Small and sweet according to another report[182]. The fruit is about 12mm in diameter[200] and is borne in bunches. Leaves - cooked[55]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked[55, 85].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. They grow especially well up elm trees[18]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.98 Vaccinium hirsutum

Hairy Huckleberry  
5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjltut hpa7tli frusflat hpa7tmwatli dyatxre7t hjonli

drutta Vaccinium hirsutum is a deciduous Shrub. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. A sweet and pleasant taste according to some reports[3, 182], though others say that it is gritty and insipid[200]. The fruit is about 6mm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that

spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Plants are self-sterile, at least two plants from different sources must be grown if seed is required. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. A freely suckering shrub when well-grown in a moist soil[182]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.99 Castanea henryi

5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 25 m hkuc  
hmimhtut cyutli hqatkyuctcup hwicli hyishrasjltutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea henryi is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 177]. Small[61, 63]. Said to be of excellent eating quality[183]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K].

tcanta Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - valued locally for construction[61].

dwatta None known  
propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Although it is very winter-hardy, this species only really thrives in areas with hot summers[200]. It is very slow growing and small in Britain[11, 200]. A shrub at Kew was 3 metres tall in 1990[K]. Resists endothia blight[105]. Plants in this genus are notably resistant to honey fungus[200]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200].

### 6.2.100 Actinidia lanceolata

5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 20 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Actinidia lanceolata is a deciduous Climber growing to 20 m (65ft 7in). See above for USDA hardiness. It is

that this species prefers shade[74]. Succeeds in acid and alkaline soils[38]. Likes a mulch of pine or spruce leaves[18, 24]. At one time this species was widely cultivated for its edible fruit, but it is fairly low yielding and has now been almost totally superseded by cultivars of *F. x. ananassa*[17]. There are some named varieties[183]. The flowers are usually unisexual[200]. (This report does not say if the plants are dioecious or monoecious.) This species produces few or no stolons[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 6.2.94 *Sidalcea malviflora*

Checkerbloom, Dwarf checkerbloom, California checkerbloom, Siskiyou checkerbloom  
5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Sidalcea malviflora* is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked. The leaves have a very mild flavour and a slightly mucilaginous texture, they make a very acceptable salad[K]. The leaves can be cooked as greens[257]. The dried mashed leaves have been used as a flavouring with black manzanita berries (*Arctostaphylos* spp)[257].

tcanta None known  
dwatta None known

propta Seed - sow spring in a greenhouse. When the seedlings are large enough to handle, prick them out into individual pots and plant them out in the summer. Division in the spring.

nwatta Prefers a deep fertile well-drained but moisture-retentive soil in full sun or with some shade at the hottest part of the day[200]. This species thrives in climates with a relatively cool summer and mild winters and tolerates temperatures down to about -15°c[200]. However, where prolonged cold temperatures are experienced without snow cover, it is best to mulch the plants well in winter with material such as bracken litter[200]. If the plants are cut back immediately after flowering they will usually produce a second flush of bloom in late summer[200]. The flowers last well when they are cut for indoor use[200]. There are many named varieties, selected for their ornamental value[200].

## 6.2.95 *Plantago maritima*

Sea Plantain, Goose tongue, California goose tongue  
5 tin 9 cyuc 3 kcaak 2 tcan 2 dwat m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwishsom hpa7tmwatli fyifxre7t hjonli

drutta *Plantago maritima* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked[2, 61, 105, 183]. A delicious flavour[172]. This is one of the nicer-tasting members of the genus, the leaves are fairly low in fibres and make an acceptable addition to a mixed salad[K]. The leaves are canned

for winter use in Alaska[183]. Seed - raw or cooked. The seed can be ground into a powder and used as a flour extender[172]. The seed is very small and tedious to harvest[172].

tcanta An important food plant for the caterpillars of many species of butterflies[30]. Dynamic accumulator.

dwatta LaxativePlantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200].

## 6.2.96 *Passiflora mollissima*

Banana Passion Fruit

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Passiflora mollissima* is an evergreen Climber growing to 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 105]. An agreeable flavour[2]. An aromatic taste, it can be eaten out of hand or used as a flavouring in ice creams, fruit salads, puddings etc[183]. A juice made from the fruit is highly prized in S. America[183]. Individual fruits are up to 15cm long and weigh 50 - 150g[196].

tcanta None known  
dwatta None known

propta Pre-soak the seed for 12 hours in warm water and then sow late winter or early spring in a warm greenhouse. If sown in January and grown on fast it can flower and fruit in its first year[88]. The seed germinates in 1 - 12 months at 20°c. Prick out the seedlings into individual pots when they are large enough to handle. It you are intending to grow the plants outdoors, it is probably best to keep them in the greenhouse for their first winter and plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Mulch the roots well in late autumn to protect them from the cold. Cuttings of young shoots, 15cm with a heel, in spring[1]. Leaf bud cuttings in spring. Cuttings of fully mature wood in early summer. Takes 3 months. High percentage[3].

nwatta Requires a well-drained soil with plenty of moisture in the growing season, otherwise it is not fussy[1]. One report says that this plant is hardy to climatic zone 6 (tolerating frosts of -20°c)[200] but this is surely a misprint. The top growth is said to tolerate slight air frosts[88] and plants are said to be hardy on a wall in the mild areas of Britain, being commonly grown around Penzance[49, 59]. In S. America plants can tolerate occasional lows to -5°c[196]. Outdoor grown plants should have their roots restricted in order to reduce vegetative growth and encourage fruiting[1]. Plants do not generally fruit well in Britain[88]. In order to improve the chances of producing fruit it is best to hand pollinate using pollen from a flower that has been open for 12 hours to pollinate a newly opened flower before midday[88]. Cultivated for its edible fruit in S. America[46, 196]. Yields of 300 fruits per vine and 30 tonnes per hectare are recorded in S. America[196]. A climbing plant, attaching itself to other plants by means of tendrils that are produced at the leaf axils. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.97 *Vitis monticola*

Sweet Mountain Grape

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

## 6.1.43 *Sophora flavescens*

Ku Shen, Shrubby sophora

tfo2n 5 tin 9 cyuc 0 kcaak 0 tcan 3 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Sophora flavescens* is an evergreen Shrub growing to 1.5 m (5ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta Insecticide Parasiticide ParasiticideThe plant is a source of an insecticide and parasiticide[74, 176]. No further details.

dwatta Anthelmintic Antibacterial Antifungal Antipruritic Astringent Bitter Carminative Diuretic Dysentery Eczema Fehrigue Leprosy Parasiticide Parasiticide Pectoral Stomachic Tonic UrinaryThe root is anthelmintic, antibacterial, antifungal, antipruritic, astringent, bitter, carminative, diuretic, febrifuge, parasiticide, pectoral, stomachic and tonic[61, 147, 174, 176, 178, 218, 279]. It is used internally in the treatment of jaundice, dysentery, diarrhoea and urinary infections[238]. It is used both internally and externally in the treatment of vaginitis, eczema, pruritis, ringworm, leprosy, syphilis, scabies and itching allergic reactions[238]. The root is harvested in the autumn and dried for later use[238]. The plant is anthelmintic and diuretic[218]. It also has antibacterial activity, inhibiting the growth of *Mycobacterium tuberculosis* and *Trichomonas vaginitis*[176, 218].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. Pre-soak stored seed for 12 hours in hot (not boiling) water and sow in late winter in a greenhouse[78]. Prick out the seedlings as soon as they are large enough to handle into individual pots in the greenhouse, and grow them on for 2 years under protected conditions. Plant them out into their permanent positions in early summer of their third year. Cuttings of young shoots with a heel, July/August in a frame[11]. Air-layering[200].

nwatta Succeeds in a well-drained moderately fertile soil in full sun[200]. Requires the protection of a sunny wall if it is to flower[182], and succeeds only in the mildest areas of the country. It grows best in the warmer areas of the country where the wood will be more readily ripened and better able to withstand winter cold[219]. Although hardy to at least -15°c[238], this species does not do very well in the relatively cool summers of Britain, the plant gradually weakens and eventually succumbs[11]. It can be grown in the milder areas of the country and be treated like a herbaceous perennial, growing afresh from the base each spring[233]. An important medicinal herb in China[61]. Plants should be container-grown and planted out whilst young, older plants do not transplant well[219]. A polymorphic species[58]. The flowers are produced on the current years growth[182]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.44 *Desmodium elegans*

tfo2n 5 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Desmodium elegans* is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the

shade. It prefers moist soil.

kcakta None known

tcanta Fibre FuelA fibre from the bark is used for ropes and paper making[146, 158]. The wood is a good fuel[146, 158].

dwatta Carminative Cholera Diuretic TonicThe roots are carminative, diuretic and tonic[240, 272]. They are used in the treatment of bilious complaints[240, 243].The juice of the root, sometimes combined with the bark juice of *Bauhinia malabarica*, is used in the treatment of cholera[272]. The juice of the bark is used in the treatment of peptic ulcers[272].

propta Seed - best sown as soon as it is ripe in a greenhouse. Scarify and pre-soak stored seed for 5 hours in warm water then sow March in a greenhouse. The seed usually germinates within 1 - 4 months at 25°c. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer and consider giving them some protection from frost in their first winter outdoors. Cuttings of half-ripe wood with a heel, July/August in a frame. Division as the plant comes into growth in the spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings in winter.

nwatta Succeeds in most soils so long as they are well-drained[182, 200]. Requires a sunny sheltered position[175, 182]. Plants are hardy to about -15°c[184]. Requires long hot summers to be at its best, the flowers are produced on the current years growth and do not open in cold wet seasons[11]. Plants send up new shoots 1 - 1.5m long annually from a woody base[11]. If the plant is not cut back to the ground by winter cold then it is best to prune it hard in late winter in order to encourage better flowering[182]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.45 *Lotus uliginosus*

Greater Bird's Foot Trefoil

tfo2n 5 tin 9 cyuc 0 kcaak 3 tcan 0 dwat 0.4 m hkuc  
htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lotus uliginosus* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Insecticide Soil reclamationAn insecticide is obtained from the plant[153]. No more details are given. This species is used as a pioneer plant in the reclamation of peat and pumice soils and on other wet acid soils that are unsuitable for the more commonly used *Trifolium* spp[200]. Nitrogen Fixer.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in situ in the spring or autumn. The seed usually germinates in 2 - 4 weeks at 15°c. If seed is in short supply, it can be sown in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring or early summer.

nwatta Succeeds in wet acid soils[200]. Dislikes shade[200]. Does well on poor soils[61]. Suitable for naturalistic and conservation plantings in situations that approximate to its natural habitat[200]. A good bee plant[74]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.46 Genista pilosa

Hairy greenweed, silkyleaf broom

tfo2n 5 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikhwisslip hpa7tmwatli hjonli

drutta Genista pilosa is an evergreen Shrub growing to 0.3 m (1ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta A good high density groundcover. Nitrogen Fixer. Location: Border, Ground Cover, Mass Planting, Rock Garden, Wildlife Garden, Woodland Garden. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2].

dwatta None known

propta Seed: Easy. Cover seed and germinate at 55-65F/13-18C. Chipping and soaking may aid germination. Do not transplant. Cuttings taken in summer, or by simple layering. Tip cuttings about 3-6 cm may be taken in mid-summer and rooted in a mist chamber or shaded frame.

nwatta Evergreen prostrate perennial (mostly) to erect shrub. Flowers, golden-yellow, cover the plants in late spring to early summer. Poor, dry, sandy, and stony soils. Full sun or part shade and well drained soil. Soil pH: Acid/Neutral/Alkaline. Foot Traffic: Light. Drought tolerant. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is miststemmed with multiple stems from the crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1].

## 6.1.47 Genista hispanica

Spanish Gorse

tfo2n 5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 0.8 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Genista hispanica is a deciduous Shrub growing to 0.8 m (2ft 7in) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Hedge HedgePlants can be grown as a low hedge[29]. A good ground cover for sunny positions[190]. Plants take about 2 years to form an effective cover[197]. They should be spaced about 60cm apart each way and can be pruned back hard if they become open or straggly with age[208].

dwatta DiureticThe flowers have been used in the treatment of dropsy[4].

propta The seed requires a period of cold stratification and is best sown autumn in a cold frame. Pre-soak stored seed for 24 hours in warm water and sow February in a cold frame. Good germination[78]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Cuttings of half-ripe wood, 5 - 10 cm with a heel, July/August in a frame. Roots are formed in the spring[11]. Cuttings of ripe wood, 5 - 10 cm with a heel, September/October in a frame. Good percentage. Plant out the following autumn[78].

nwatta Easily grown in a light well-drained soil in a sunny position[1]. Prefers a rather dry stony or sandy soil

and does better in one on the poor side[11]. Established plants are drought tolerant[190]. Plants are hardy to about -20°c[184]. Resents root disturbance and should be planted into its permanent position whilst small[11]. A very ornamental plant[1], it grows well on the top of walls and on hot dry banks, covering them with a dense mass of prickly greenery[182]. The flowers have a sweet refreshing perfume, like ripe apples or pineapples[245]. Plants occasionally die back in the centre of the clump, especially after cold wet winters. Cut out the dead growth and layer living shoots into the gap[200]. Closely related to *G. tournefortii*. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 6.1.48 Cytisus decumbens

Prostrate Broom

tfo2n 5 tlin 8 cyuc 0 kcak 4 tcan 0 dwat 0.2 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikhwisslip hpa7tmwatli hjonli

drutta Cytisus decumbens is an evergreen Shrub growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta Soil stabilizationNitrogen fixer. Groundcover. A reasonable groundcover shrub with a medium density. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2]. Container gardening. Erosion control.

dwatta None known

propta

nwatta A flowering deciduous shrub with branching stems that are wiry and hairy leaves. Sun: Full Sun, Partial Shade. Soil Type: Sandy, Loamy. Soil Moisture: Dry, Moderate. Soil pH: 5.0 - 8.0. Drought: Tolerant. Root Type: Fibrous ShallowGrowth Rate: Moderate. Life Span: Short. Form: Prostrate. Texture: Medium. Fungal Types: Endomycorrhizal. Seasonal Interest: Spring-Summer. Notes: This plant needs good drainage but is tolerant of nutrient-poor soils. Fruit Type: Pod. Flower Color: Yellow. USDA Hardiness Zones: 5 - 8. Flood: Sensitive.Salt: Intolerant. Soil Compaction: Intolerant. Cold Injury: Infrequent. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer. Bloom Time: Late Spring - Early Summer [318-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2].

## 6.2 mran

### 6.2.1 Castanea sativa

Sweet Chestnut, European chestnut

5 tlin 7 cyuc 5 kcak 5 tcan 2 dwat 30 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea sativa is a deciduous Tree growing to 30 m (98ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

and polymorphic species[200], there are many named varieties[184]. This species was named for a sterile (or 'mop head') cultivar so that the true species should really be referred to as *H. macrophylla normalis*[182]. Plants are cultivated for their leaves in China and Japan. Plants are very tolerant of pruning and can be cut back into old wood if required[188]. This species is notably susceptible to honey fungus[200]. Special Features:Not North American native, All or parts of this plant are poisonous, Suitable for cut flowers, Suitable for dried flowers, Blooms are very showy.

### 6.2.91 Corylus sieboldiana mand-schurica

Hairy hazel, Japanese hazelnut,

5 tlin 9 cyuc 3 kcak 1 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikhwisslip hpa7tmwatli fyif hjonli

drutta Corylus sieboldiana mandschurica is a deciduous Shrub growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[63, 74, 105]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed[105].

tcanta OilNone known

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[1, 11], but it dislikes very acid soils[17]. Plants are fairly well tolerant[1, 11]. This species is closely allied to *C. cornuta*, and often bears good crops of seeds in Britain[11]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

### 6.2.92 Vaccinium membranaceum

Mountain Huckleberry, Thinleaf huckleberry

5 tlin 9 cyuc 3 kcak 0 tcan 1 dwat m hkuc hmimhtut cyutli hgattcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium membranaceum is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 159, 172, 257]. A sweet but rather acid

flavour[11]. Sour but delicious according to other reports[177, 200]. A reasonable source of vitamin C[257]. This fruit is amongst the largest and best flavoured of all the wild blueberries[183]. The native North Americans would often dry the fruit for use in the winter[256].

tcanta None known

dwatta Antiarthritic Antiseptic Astringent Cardiac Carminative Hypoglycaemic Vitamin CAntiseptic, astringent, carminative, hypoglycaemic[172]. An infusion of the roots and stems has been used in the treatment of heart troubles, arthritis and rheumatism[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Established plants are extremely drought resistant[183]. Plants are very hardy, tolerating temperatures down to about -40°c in N. America[160]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.93 Fragaria moschata

Hautbois Strawberry

5 tlin 9 cyuc 3 kcak 2 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Fragaria moschata is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. Sweet and succulent. The fruit is small but has an excellent flavour and is very aromatic[61, 142, 183, K]. It is greatly superior to the cultivated strawberries, but is not very freely produced[K].

tcanta An excellent ground cover plant, spreading vigorously by means of surface stolons and forming a dense carpet of growth[K]. It grows well amongst shrubs but is likely to suffocate smaller plants[K]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta None known

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[200]. Tolerates semi-shade though fruit production will be reduced[38]. Another report says



dwatta TB TonicAn infusion of the bark has been used in the treatment of TB[257]. The raw sap has been used as a tonic[257].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Aggressive surface roots possible, Pollard, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil[1] and a position that is at least moderately sunny[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Growth of young plants is rapid in the wild, slowing down after 40 -50 years with a maximum life span of about 275 years[229]. This species thrives in Britain but it can be cut back in a severe winter if that follows a mild autumn[11]. A very ornamental plant[1]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:North American native, Fragrant flowers, Inconspicuous flowers or blooms.

## 6.2.89 Aesculus chinensis

Chinese Horse Chestnut

5 tin 9 cyuc 3 kcaak 0 tcan 1 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikwi hpa7tmwatli xre7t hjonli

drutta Aesculus chinensis is a deciduous Tree growing to 25 m (82ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be dried and ground into a powder and used as a gruel. The seed is quite large, it can be 3cm in diameter, and is easily harvested. Unfortunately it is also rich in saponins, these must be removed before it can be used as a food and this process also removes many of the minerals and vitamins, leaving behind mainly starch. See also the notes above on toxicity. The following notes apply to A. californica, but are probably also relevant here:- The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213].

tcanta Soap WoodSaponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K].

dwatta Antirheumatic EmeticThe seed is antirheumatic and emetic[178, 218]. The sweet tasting seed is said to be used in the treatment of contracted limbs that are due to palsy or rheumatism[178, 218]. It is also used in the treatment of stomach aches[218].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Prefers a deep loamy well-drained soil but is not too fussy[11]. Plants grow best in eastern and south-eastern areas of England, probably needing a continental climate in order to thrive[11, 200]. Although the trees are very hardy when dormant, the new growth can be damaged by late spring frosts[11]. Most members of this genus transplant easily, even when fairly large[111].

## 6.2.90 Hydrangea macrophylla

French hydrangea , Florist's Hydrangea, Bigleaf Hydrangea 5 tin 9 cyuc 3 kcaak 3 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli frusflatprikwi hpa7tmwatli xre7t hjonli

drutta Hydrangea macrophylla is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: SweetenerThe young leaves, when dried and rubbed between the hands, become very sweet and are used to make a sweet tea called 'tea of heaven', it is used in Buddhist ceremonies[183]. The leaves contain phellodulin (its chemical formula is C16 H14 O), a very sweet substance that can be used as a sugar substitute[116, 183]. One small leaf is sufficient to sweeten a cup of tea[218]. The older leaves can be dried, powdered and used as a flavouring on foods[105, 177]. The young leaves and shoots are also eaten cooked[105, 177]. Young leaves contain the toxin hydrocyanic acid, this reduces as the leaves grow older, often to zero levels[218].

tcanta Hedge HedgeA useful hedging plant because of its vigorous growth. The Hortensias or mop-head cultivars are recommended[200].

dwatta Antiperiodic Antitussive Diuretic MalariaThe leaves, roots and flowers are antimalarial, antitussive and diuretic[218, 240]. They are said to be a more potent antimalarial than quinine, due to the presence of an alkaloid[240].

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Landscape Uses:Container, Seashore, Specimen. Tolerates most soil[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Prefers a shady position[1]. Does well on very acid soils with a pH around 4.5[200]. Plants also tolerate alkaline soils, though they become chlorotic on shallow soils over chalk[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil[200]. A very wind resistant plant when grown in mild areas[166]. Dormant plants are hardy to about -10°C[184], though the young growth in spring is frost-tender[K]. A very ornamental plant

kcaakta Edible Parts: SeedEdible Uses: Cof-fee SweetenerSeed - raw or cooked[2, 4, 5, 9, 12, 34]. A somewhat astringent taste raw, it improves considerably when cooked and is delicious baked with a floury texture and a flavour rather like sweet potatoes[K]. The seed is rich in carbohydrates, it can be dried, then ground and used as a flour in breads, puddings, as a thickener in soups etc[7, 63, 132, 183]. The roasted seed can be used as a coffee substitute[183]. A sugar can be extracted from the seed[183].

tcanta Basketry Fuel Hair Starch Tannin WoodTannin is obtained from the bark[46, 223]. The wood, leaves and seed husks also contain tannin[223]. The husks contain 10 - 13% tannin[223]. On a 10% moisture basis, the bark contains 6.8% tannin and the wood 13.4%[223]. The meal of the seed has been used as a source of starch and also for whitening linen cloth[4]. A hair shampoo is made from the leaves and the skins of the fruits[7]. It imparts a golden gleam to the hair[7]. Wood - hard, strong, light. The young growing wood is very durable, though older wood becomes brittle and liable to crack[4]. It is used for carpentry, turnery, props, basketry, fence posts etc[4, 6, 7, 23, 46, 100]. A very good fuel[6].

dwatta Antiarrhoeal Antiinflammatory Astringent Bach ExpectantAlthough more commonly thought of as a food crop, sweet chestnut leaves and bark are a good source of tannins and these have an astringent action useful in the treatment of bleeding, diarrhoea etc. The leaves and bark are anti-inflammatory, astringent, expectorant and tonic[4, 7, 165]. They are harvested in June or July and can be used fresh or dried[4]. An infusion has been used in the treatment of fevers and ague, but are mainly employed for their efficacy in treating convulsive coughs such as whooping cough and in other irritable conditions of the respiratory system[4, 7]. The leaves can also be used in the treatment of rheumatism, to ease lower back pains and to relieve stiff muscles and joints[254]. A decoction is a useful gargle for treating sore throats[254]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Extreme mental anguish', 'Hopelessness' and 'Despair'[209].

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Global Crop Industrial Crop: Biomass Industrial Crop: Tannin Management: Standard Staple Crop: Balanced carbPrefers a good well-drained slightly acid loam in a sunny position but it also succeeds in dry soils[1, 11, 200, 238]. Once established, it is very drought tolerant[1, 11, 200, 238]. Plants are very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Tolerates maritime exposure though it is slower growing in such a position[75]. The dormant plant is very cold-hardy in Britain, though the young growth in spring, even on mature plants, is frost-tender[K]. The sweet chestnut is often cultivated for its edible seed in warm temperate zones, there are several named varieties[46, 183]. Both 'Marron de Lyon' and 'Paragon' produce fruits with a single large kernel (rather than 2 - 4 smaller kernels) and so are preferred for commercial production[238]. Castanea sativa x crenata: The hybrid sweet chestnut 'Marigoule' is a good choice if you only want to grow one tree as Marigoule is a partly self-fertile cultivar. Sweet chestnuts require a warm dry summer in order to ripen their fruit properly in Britain[63] and even then these seeds are generally inferior in size and quality to seeds grown in continental climates[4]. Most species in this genus are not very well adapted for the cooler maritime climate of Britain, preferring hotter summers, but this species grows well here[11, 200]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229] and they are very attractive to bees[7]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. At one time this tree was widely grown in coppiced woodlands for its

wood, but the practise of coppicing has fallen into virtual disuse[111]. Trees regrow very quickly after being cut down, producing utilizable timber every 10 years. This species is not often seen in Cornwall though it grows very well there[59]. Trees take 30 years from seed to come into bearing[98]. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 6.2.2 Sassafras albidum

Sassafras, Common Sassafras

5 tin 9 cyuc 5 kcaak 3 tcan 3 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Sassafras albidum is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from April to October, in flower from May to June, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Condi-ment TeaLeaves - raw or cooked. The young leaves can be added to salads whilst both old and young leaves can be used as a flavouring and as a thickening agent in soups etc[2, 20, 55, 62, 82, 102, 183]. They have a mild aromatic flavour[K]. The leaves are often dried and ground into powder for later use[82, 159, 183]. The young shoots have been used to make a kind of beer[4]. The dried root bark can be boiled with sugar and water until it forms a thick paste[183]. It is then used as a condiment[183]. The root and the berries can also be used as flavourings[55, 142]. Winter buds and young leaves - raw[62, 183]. A tea is made from the root bark, it is considered to be a tonic[18, 20, 55, 62]. The tea can also be made by brewing the root in maple syrup, this can be concentrated into a jelly[183]. A tea can also be made from the leaves and the roots. It is best in spring. A tea can be made from the flowers[2].

tcanta Companion Dye Essential Repellent WoodAn essential oil is obtained from the bark of the root[61] and also from the fruits[4]. One hundred kilos of root chips yield one litre of essential oil under steam pressure - this oil comprises about 90% safrol[245]. The oil is medicinal and is also used in soaps, the coarser kinds of perfumery, toothpastes, soft drinks etc[4, 46, 57, 82]. It is also used as an antiseptic in dentistry[61]. A yellow dye is obtained from the wood and the bark[4, 168]. It is brown to orange[168]. The plant repels mosquitoes and other insects[18, 20]. Wood - coarse-grained, soft, weak, fragrant, brittle, very durable in the soil. It weighs 31lb per cubic foot and is used for fence posts and items requiring lightness[46, 82, 171, 227].

dwatta Alterative Anodyne Antirheumatic Antiseptic Aromatic Carminative Diaphoretic Diuretic Stimulant VasodilatorSassafras has a long history of herbal use. It was widely employed by many native North American Indian tribes who used it to treat a wide range of complaints, valuing it especially for its tonic effect upon the body[257]. It is still commonly used in herbalism and as a domestic remedy. The root bark and root pith are alterative, anodyne, antiseptic, aromatic, carminative, diaphoretic, diuretic, stimulant and vasodilator[4, 21, 46, 165]. A tea made from the root bark is particularly renowned as a spring tonic and blood purifier as well as a household cure for a wide range of ailments such as gastrointestinal complaints, colds, kidney ailments, rheumatism and skin eruptions[222, 238, 257]. The muclaginous pith from the twigs has been used as a poultice or wash for eye ailments and is also taken internally as a tea for chest, liver and kidney complaints[222]. An essential oil from the root bark is used as an antiseptic in dentistry and also as an anodyne[213]. The oil contains safrole, which is said to have carcinogenic activity and has been banned from use in

American foods - though it is less likely to cause cancer than alcohol[222]. In large doses the oil is poisonous, causing dilated pupils, vomiting, stupor, collapse and kidney and liver damage[4, 238]. The oil has been applied externally to control lice and treat insect bites, though it can cause skin irritation[238].

propta Seed - best sown as soon as ripe in a cold frame[200]. Stored seed requires 4 months cold stratification at 4°C[113]. It is best sown as early in the year as possible. Prick out the seedlings into individual pots as soon as possible and grow them on in the greenhouse. One report says to harden off the plants as soon as possible[78], but young plants are frost-tender[11] and so we recommend growing them on in the greenhouse for their first winter and then planting them out in early summer. Give the young trees some protection for at least their first winter outdoors[K]. Root cuttings, taken from suckers, 1 - 2cm long taken in December. Plant horizontally in pots in a greenhouse[78]. Suckers in late winter. Plant straight out into their permanent positions[200].

nwatta Landscape Uses:Pest tolerant, Massing, Specimen, Woodland garden. Requires a deep, fertile, well-drained, lime-free, near neutral soil in sun or light shade[11, 200]. Does well in a woodland garden[166], especially in a sheltered position along the edge[200]. The plant is tender when young, the young shoots of older trees can also be damaged by late spring frosts[11, 238]. A very ornamental plant[1] with a wide range of uses, it is occasionally cultivated and often gathered from the wild[61]. All parts of the tree contain essential oils and give off a pleasant spicy aroma when crushed[229]. The stem bark is highly aromatic, more so than the wood. The root stem bark is the most pleasant of all[245]. The flowers have a spicy perfume[245]. Trees are long-lived, moderately fast-growing and disease-free in the wild[227, 229]. They can begin flowering when only 10 years old and good seed crops are usually produced every 2 - 3 years[229]. The trees spread by root suckers and can form thickets[229]. Although some flowers appear to be hermaphrodite, they are functionally either male or female and most trees are dioecious[229]. Both male and female plants must be grown if seed is required. Special Features:North American native, Attracts butterflies, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 6.2.3 Cornus kousa

Japanese Dogwood, Kousa dogwood, Chinese Dogwood, 5 tlin 8 cyuc 5 kcaak 2 tcan 0 dwat 10 m hkuc hmimhtut cyuti tcup hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Cornus kousa is a deciduous Tree growing to 10 m (32ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[61, 177]. Sweet and juicy[11, 183], it is very nice in small quantities[K]. Very seedy[105]. The skin is rather tough and unpleasant, but the pulp is delicious with a

custard-like texture, it is one of our favourite late summer fruits[K]. The fruit is about 2cm in diameter[200]. Young leaves - cooked[105, 177, 183].

tcanta WoodWood - very hard and heavy. Used for mallets etc[151].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Pest tolerant, Specimen, Woodland garden. An easily grown plant, it succeeds in any soil of good or moderate fertility, from acid to slightly alkaline but dislikes shallow chalky soils[184, 188]. Grows well in heavy clay soils. Prefers a rich well-drained loamy soil and a position that is at least partially sunny[11]. A very ornamental plant[1], it is hardy to about -20°C[184]. A number of named forms have been developed for their ornamental value[182]. Plants are slow-growing when young, they speed up somewhat after a few years but then soon slow down again[202]. The sub-species of *C. kousa chinensis* grows more freely, flowering and fruiting better in Britain though it barely differs in appearance from the species[11]. This species has been known to hybridize with *C. capitata*[182]. The cultivar 'Norman Hadden' could be such a hybrid[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, Not North American native, Blooms are very showy. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 6.2.4 Morus nigra

Black Mulberry 5 tlin 9 cyuc 5 kcaak 3 tcan 3 dwat 10 m hkuc hmimhtut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyif hjonli

drutta Morus nigra is a deciduous Tree growing to 10 m (32ft) by 15 m (49ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kckahta Edible Parts: FruitEdible Uses: Fruit - raw, cooked or used in preserves[1, 2, 3, 4, 7, 9, 183]. A delicious slightly acid flavour, it makes an excellent dessert fruit and can be eaten in quantity[K]. The fruit is juicy and refreshing, though it must be used as soon as it is ripe (from mid-August to September) otherwise it will start to rot[200]. The fruit falls from the tree as soon as it is fully ripe. It is best, therefore, to grow the tree in short grass to cushion the fall of

is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist or wet soil and can grow in water. The plant can tolerate maritime exposure.

kckahta Edible Parts: Root SeedEdible Uses: Root - raw or cooked. Rich in starch, it is usually dried and ground into a powder[2, 55, 74, 144]. The roots form tubers at intervals along their length and new plants are formed from these tubers. When first formed, the tubers are white and starchy with a sweet coconut-milk flavour, they become black and woody with age[193]. Tubers can be up to 2.5cm in diameter[193]. Seed - cooked[257]. They can be ground into a powder and used as a mush[257].

tcanta Basketry WeavingThe leaves are used in weaving and basketry[74, 257]. The leaves have been used to secure the edges of woven mats, as the warp for sandals, as the warps and twining wefts for clothing, to secure the edges of skirts etc[257]. They have been used to make twined mats for the insides of houses[257].

dwatta Astringent DiureticThe root is astringent and diuretic[240]. It is used in the treatment of amenorrhoea, dysmenorrhoea, abdominal pain or tumours for post-partum females, abdominal distension and indigestion[176].

propta Seed - sow in a cold frame as soon as it is ripe in a pot standing in 3cm of water. Only just cover the seed with soil[200]. The seed usually germinates fairly quickly. Prick out the plants when large enough to handle and plant out in their permanent positions in early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any wet to moisture retentive ground, pond margins and shallow water in full sun or shade[200].

## 6.2.87 Helianthus maximiliani

Maximilian Sunflower, Maximilian Daisy 5 tlin 10 cyuc 3 kcaak 0 tcan 0 dwat m hkuc htut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Helianthus maximiliani is a PERENNIAL growing to 2.4 m (7ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: RootEdible Uses: Tubers - raw or cooked[22, 46, 61, 257]. Similar in flavour to Jerusalem artichokes, but lower yielding. Seed - raw or cooked[183]. An edible oil is obtained from the seed[183].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Management: Standard Staple Crop: Protein-oilLandscape Uses:Border, Container, Specimen. Succeeds in most soils in a sunny position[1]. Requires a rich soil[1]. Dislikes shade[1]. The young growth is extremely attractive to slugs, plants can be totally destroyed by them[K]. At least

one named form has been developed. Called 'Prairie Gold', it is being investigated by the Land Institute in Salina, Kansas for its oil-seed potential in a non-tillage permaculture system[183]. The yield of edible tubers is not very high. This species is closely related to *H. giganteus*[1]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Plants have a running root system and can be invasive[1]. Special Features:Attracts birds, North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 6.2.88 Acer macrophyllum

Oregon Maple, Bigleaf maple, Oregon Maple 5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyuti tcup hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Acer macrophyllum is a deciduous Tree growing to 30 m (98ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Flowers Inner bark Leaves Sap S Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[105, 177, 183]. The syrup is used as a sweetener on many foods. The concentration of sugar is somewhat lower than in the sugar maples (*A. saccharum*). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates. Inner bark[177]. Eaten in small quantities with oil[257]. No more details are given but inner bark is often dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread. The leaves, when wrapped round food during baking, impart a nice flavour to the food[99, 118]. Yellow flower clusters - raw. They are sweet with nectar[183]. Seeds - sprouted and then boiled[226]. The sprouted seeds are generally bitter, but the young shoots are quite sweet and juicy[257]. The seeds are about 6mm long and are produced in small clusters[82].

tcanta Basketry Companion Fibre Fuel Hair Preservative Scourer WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. A sticky gum obtained from the buds in spring has been mixed with oil and used as a hair tonic[257]. A fibre obtained from the inner bark is used for making scouring pads, rope and crude dresses[99, 118, 257]. It was harvested in the spring and was also used in making baskets[257]. Young stems are used as coarse twine warp and weft in the manufacture of baskets[257]. Wood - light, soft, not strong, close grained. It is highly valued for timber, furniture and indoor use and is also used for carving bowls, veneer etc[46, 61, 82, 99, 118, 229]. It makes an excellent fuel, producing a hot smokeless flame[226].

of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees are not well suited to the British climate and usually grow poorly here. They fail to properly ripen their wood which results in frost damage overwinter[200]. A slow-growing but long-lived tree[227], it takes 25 - 30 years before it starts to produce seeds[229]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Large crops are produced every 3 - 4 years with low production in the intervening years[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

## 6.2.85 Pinus jeffreyi

Jeffrey Pine

5 tlin 8 cyuc 3 kcaak 3 tcan 2 dwat 25 m hkuc htut cyutli hgtakuyuctcp hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus jeffreyi is an evergreen Tree growing to 25 m (82ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, and the seeds ripen from January to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Sap SeedEdible Uses: ConditmentSeed - raw or cooked[105, 177]. Large[183]. The oil-rich seed has a resinous flavour and is about 10 - 12mm long[82, 200]. The crystallised sap has been gathered and eaten like candy[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulp-wood[200].

tcanta Dye Herbicide Resin WoodLandscape Uses: Aggressive surface roots possible, Specimen. A tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The resin contained in this plant is very unusual in that it contains the hydrocarbon n-heptane. This is unmixed with other isomers of heptane and is formed by a very complex and little understood biochemical process. Its purity lead it to be used as the zero-point in the octane rating for petrol[200]. Wood - light, strong and fine-grained, it can vary from soft to hard[229]. It is used for making furniture, boxes, toys etc[229]. Special Features: Attractive foliage, North American native, Inconspicuous flowers or blooms.

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It

is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional TimberSucceeds in most soils[129], but prefers a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. A very ornamental plant[120]. It is often short-lived in Britain but is moderately fast growing with some trees reaching a height of 15 metres in 29 years[185]. A long-lived tree in the wild, specimens 500 years old are known[229]. It commences bearing seeds when about 10 - 15 years old, though good production does not commence until twice that age[229]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Closely related to *P. ponderosa*[1], and hybridizes with it in the wild[71]. Some of the earlier plantings under this name in Britain have turned out to be *P. ponderosa*[185]. The cones are 12 - 35cm long, they open and shed their seed whilst still attached to the tree[82, 226]. The resin from broken shoots has a very strong lemon scent[185]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 6.2.86 Scirpus maritimus

Seaside Bulrush. Cosmopolitan Bulrush

5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat m hkuc htut cyutli tcuphja7nhs6b hwicli hrasjlutnyik hpa7tli flatprik-wishsom hpa7tmwatli hjonli

drutta Scirpus maritimus is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species

the fruit but to still make it possible to find and harvest[K]. The fruit can also be dried and ground into a powder[183]. The fruit is up to 25mm in diameter[200, 227]. White Mulberry (*Morus alba*) has edible young leaves and shoots eaten cooked[105, 183] but we have found no information for this plant.

tcanta Dye Fibre WoodA fibre used in weaving is obtained from the bark[7]. A red-violet to dark purple dye is obtained from the fruit[168]. A yellow-green dye is obtained from the leaves[168]. Wood - used in joinery[100].

dwatta Anthelmintic Astringent Homeopathy Hypoglycaemic Laxative Odontalgic Purgative UrinaryThe mulberry has a long history of medicinal use in Chinese medicine, almost all parts of the plant are used in one way or another[238]. The white mulberry (*M. alba*) is normally used, but this species has the same properties[238]. Recent research has shown improvements in elephantiasis when treated with leaf extract injections and in tetanus following oral doses of the sap mixed with sugar[238]. Analgesic, emollient, sedative[7, 176]. The leaves are antibacterial, astringent, diaphoretic, hypoglycaemic, odontalgic and ophthalmic[218, 238]. They are taken internally in the treatment of colds, influenza, eye infections and nosebleeds[238]. The leaves are collected after the first frosts of autumn and can be used fresh but are generally dried[238]. The stems are antirheumatic, diuretic, hypotensive and pectoral[218, 238]. A tincture of the bark is used to relieve toothache[7]. The branches are harvested in late spring or early summer and are dried for later use[238]. The fruit has a tonic effect on kidney energy[218, 238]. It is used in the treatment of urinary incontinence, tinnitus, premature greying of the hair and constipation in the elderly[238]. Its main use in herbal medicine is as a colouring and flavouring in other medicines[4]. The root bark is antitussive, diuretic, expectorant and hypotensive[238]. It is used internally in the treatment of asthma, coughs, bronchitis, oedema, hypertension and diabetes[238]. The roots are harvested in the winter and dried for later use[238]. The bark is anthelmintic and purgative, it is used to expel tape worms[4, 240]. Extracts of the plant have antibacterial and fungicidal activity[218]. A homeopathic remedy is made from the leaves[9]. It is used in the treatment of diabetes[9].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. It is said that cuttings of older wood up to 2.5 metres long can be readily made to strike[4]. The cuttings are taken in February and planted 30cm deep in a shady sheltered position outdoors. The stem is wrapped in moss to prevent water loss by transpiration, with only the top few buds not being covered[4]. Layering in autumn[200].

nwatta Prefers a warm moist but well-drained loamy soil in a sheltered sunny position[1, 11]. Prefers a light soil[37]. Plants are very tolerant of atmospheric pollution[4]. Trees are hardy as far north as southern Sweden[4]. A slow growing[200] but very ornamental tree[1], the mulberry is sometimes cultivated in gardens for its delicious edible fruit[183]. The tree is not grown on a commercial scale because the fruit is too soft and easily damaged to allow it to be transported to market, and is therefore best eaten straight from the tree. There are some named varieties[183]. The mulberry takes many years to settle down and produce good crops of fruit, about 15 years being the norm[4]. Trees fruit well in southern and south-western Britain[59, 200] but they require the protection of a wall further north if the fruit is to ripen[200]. This is a good tree for growing grapes into[20]. It means that the grapes are difficult to pick, but they always seem to be healthier and free from fungal diseases[201]. Plants are late coming into leaf and also lose their leaves at the first autumn frosts though the tree in leaf casts quite a dense

shade[200]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. Once considered to be a very long-lived tree, doubts are now being cast on this assumption, it is probably fairly short-lived[11]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 6.2.5 Cornus kousa chinensis

Japanese Dogwood

5 tlin 8 cyuc 5 kcaak 2 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta Cornus kousa chinensis is a deciduous Tree growing to 10 m (32ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[61, 177]. Sweet and juicy[11, 183], it is very nice in small quantities[K]. Very seedy[105]. The skin is rather tough and unpleasant, but the pulp is delicious with a custard-like texture[K]. This fruit gained very high marks from a group of 7 people in a fruit-tasting visit to various gardens[K]. The fruit is about 2cm in diameter[200]. Young leaves - cooked[105, 177, 183].

tcanta WoodWood - very hard and heavy. Used for materials etc[151].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Does not like chalky soils according to other reports[184, 188]. Grows well in heavy clay soils. Prefers a rich well-drained loamy soil and a position that is at least partially sunny[11]. A very ornamental plant[1], it is hardy to about -20°C[184]. A number of named forms have been developed for their ornamental value[182]. Plants are slow-growing when young, they speed up somewhat after a few years but then soon slow down again[202]. This sub-species of *C. kousa* grows more freely, flowering and fruiting better in Britain though it barely differs in appearance from

the species[11]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.6 Amelanchier laevis

Allegheny Shadberry, Allegheny serviceberry, Smooth Serviceberry

5 tlin 8 cyuc 5 kcak 2 tcan 1 dwat 9 m hkcuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli frusflat-prik hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier laevis is a deciduous Shrub growing to 9 m (29ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckata Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[2, 11, 105, 159]. Succulent and sweet[82, 183]. This is one of the nicest fruits in the genus, it can be eaten and enjoyed in quantity[K]. The fruit can also be dried for winter use[183]. Up to 18mm in diameter[200]. The fruit is rich in iron and copper[226].

tcanta Miscellany WoodWood - heavy, exceedingly hard, strong, close grained. Used for tool handles etc[82].

dwatta MiscellanyAn infusion of the bark was used by expectant mothers[257].

propta Seed - it is best harvested ‘green’, when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Landscape Uses:Firewood, Specimen, Woodland garden. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Found in the wild on light acidic soils[17]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals, this species is worthy of especial attention because of the quality of its fruit. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Trees come into bearing in about 12 years from seed[98]. Considerable confusion has existed between this species and A. arborea, A. canadensis and A. lamarcii, see [11] for the latest (1991) classification. It hybridizes with A. sanguinea, A. huronensis, A. wiegandii, A. stolonifera, A. canadensis, A. arborea and A. bartramiana. Grafting onto seedlings of A. lamarcii or Sorbus aucuparia is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:Attracts birds, North American native, Attracts butterflies, Blooms are very showy.

### 6.2.7 Crataegus pennsylvanica

5 tlin 9 cyuc 5 kcak 0 tcan 2 dwat 9 m hkcuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwlisslp hpa7tmwatli xre7t hjonli

drutta Crataegus pennsylvanica is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in

flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kckata Fruit - raw or cooked. A very good size fruit, up to 25mm in diameter, with a lovely semi-sweet flavour even when semi-ripe, it makes a delicious dessert[K]. It is also sometimes made into jellies[82] and can be dried for later use. The fruit is borne in clusters of 4- 12 and is very easily harvested[82, K]. There are up to five fairly large seeds in the centre of each fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed ‘green’ (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This species has a good potential as a fruit crop in Britain. It regularly produces heavy crops of high quality, the tree is very easily grown and is little troubled by pests or diseases. It also requires very little attention, once the trees are established virtually the only work needed is to harvest the fruit each year[K]. A tree about 5 metres tall and wide at Kew fruits regularly and very heavily[K]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

### 6.2.83 Carya laciniosa

Shellbark Hickory

5 tlin 9 cyuc 3 kcak 3 tcan 1 dwat 30 m hkcuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyf hjonli

drutta Carya laciniosa is a deciduous Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckaata Edible Parts: Sap SeedEdible Uses: SweetenerSeed - raw or cooked in pies, cakes etc[183]. Sweet, with a very fine flavour[183], it has the largest seeds of the hickories[227], up to 5cm long[229]. Probably the finest flavoured hickory[117]. The shell is hard and thick[101, 117] and the cracking quality is poor compared to C. ovata[183]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. Sap - a sweet flavour[62]. Tapped in spring, it can be boiled down to a syrup or sugar and be used in similar ways to maple syrup[101, 183].

tcanta Fuel WoodWood - close-grained, tough, hard, heavy, elastic, very flexible. It weighs 50 lb. per cubic foot. An excellent wood, it is used for tool handles, baskets, fuel etc[46, 61, 63, 82, 226, 227]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Astringent DetergentThe inner bark is astringent and detergent[257]. It has been used as a dressing for cuts and has been chewed to treat sore mouths[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Management: Standard Regional Crop Staple Crop: OilLandscape Uses:Pest tolerant, Aggressive surface roots possible. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. A very ornamental but slow growing tree[1], it is sometimes cultivated for its edible seed, and is also sold in local markets in N. America[82]. There are some named varieties[183] though some of these are likely to be hybrids. ‘Fayette’ is a thin shelled form[200]. ‘Henry’ has a very large nut[200]. Trees have been planted on an experimental scale in Germany for their wood[50]. Hybridizes in the wild with C. ovata[227]. Trees take up to 15 years from seed to bear fruit[117]. Plants are strongly taprooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees

beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Special Features:North American native, Wetlands plant, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 4. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of ‘heat days’ experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 6.2.84 Quercus lyrata

Overcup Oak

5 tlin 9 cyuc 3 kcak 0 tcan 2 dwat 30 m hkcuc hmimhtut cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus lyrata is a deciduous Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kckaata Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. The seed is about 25mm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed is fairly sweet and does not contain many bitter tannins[159]. It does not require much leaching but any bitterness can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - close-grained, hard, tough, strong, heavy, very durable in contact with the ground[82]. It weighs 51lb per cubic foot. Used for construction, tools, furniture etc[46, 82, 227].

dwatta Astringent DysenteryThe leaves and bark are astringent[46, 61]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities

so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. The leaves are richly aromatic[245].

### 6.2.81 Ulmus glabra

Wych Elm, Table-top Scotch Elm, Scotch Elm
5 tlin 7 cyuc 3 kcaak 0 tcan 2 dwat 30 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ulmus glabra is a deciduous Tree growing to 30 m (98ft) by 25 m (82ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from February to March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit Inner bark LeavesEdible Uses: Leaves - raw or cooked[179, K]. They can be a little bit bitter, especially if not very young, and have a mucilaginous texture[K]. They make a nice addition to a mixed salad[K]. Immature fruits, used just after they are formed, can be eaten raw[132]. An aromatic, unusual flavour, leaving the mouth feeling fresh and the breath smelling pleasant[132]. They contain about 34.4% protein, 28.2% fat, 17% carbohydrate, 5% ash[179]. The fruit is about 2.5cm long[200]. Inner bark - mucilaginous[179]. No more details are given but inner bark is often dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[K].

tcanta Fibre WoodA fibre from the inner bark is used for mats and making ropes[100]. Wood - very durable under water, fairly hard, elastic, withstands abrasion and salt water. Used for water pipes, wheels, mallet heads, ships keels etc[46, 61, 67, 100].

dwatta Astringent Bach Demulcent Diuretic Eczema HomeopathyThe inner bark is astringent, demulcent and mildly diuretic[9]. It is used both internally and externally in the treatment of diarrhoea, rheumatism, wounds, piles etc and is also used as a mouthwash in the treatment of ulcers[4, 9, 66]. The inner bark is harvested from branches 3 - 4 years old and is dried for later use[9]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Occasional feelings of inadequacy', 'Dependancy' and 'Exhaustion from over-striving for perfection'[209]. A homeopathic remedy is made from the inner bark[9]. It is used in the treatment of eczema[9].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Landscape Uses:Specimen. Easily grown in any soil of at least moderate quality so long as it is well drained[1]. Prefers a deep or heavy soil that is moist but not waterlogged and does not thrive if the soil is markedly acid[186]. Moderately shade tolerant[186]. Very wind resistant and tolerant of maritime exposure[186]. Trees cast a dense shade[186]. Rarely produces suckers but responds well to coppicing[186]. The wych elm is subject to 'Dutch elm disease' (though less so than *U. procera*), a disease that has destroyed the greater part of all the elm trees growing in Britain. Mature trees killed back by the disease will often regrow from suckers, but these too will succumb when they get larger. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant to the disease so the potential exists to develop new resistant hybrids with the native species. The various species hybridize freely, the pollen stores well and can be kept for use with species that flower at different times. A very ornamental tree[1], it is a food plant for the caterpillars of many lepidoptera species[30]. A good tree for growing grapes into[18]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 6.2.82 Carya pallida

Sand Hickory
5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 30 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Carya pallida is a deciduous Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 177]. Rather thin-shelled, the seed is small and sweet[82, 235]. The seed is up to 3cm long[229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel WoodWood - heavy, hard, tough. Used for tool handles etc[82]. A good fuel, burning well and giving off a good heat[229].

dwatta Astringent DetergentThe inner bark is astringent and detergent[257]. It has been used as a dressing for cuts and has been chewed to treat sore mouths[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the

### 6.2.8 Crataegus arnoldiana

Arnold Hawthorn
5 tlin 9 cyuc 5 kcaak 0 tcan 2 dwat 7 m hkuc hmimhtut cyutli hgatkycutcuphja7n hwicli hrasljutnyikfrip hpa7tli flatprikliwisliip hpa7tmwatli xre7t hjonli

drutta Crataegus arnoldiana is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midge. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Sub-acid[82]. A delicious flavour, it is sweet with a soft juicy flesh and makes an excellent dessert fruit[K]. It can also be cooked and used in pies, preserves etc and can be dried for later use. The fruit ripens in early September in southern Britain[K]. The fruit is about 2cm in diameter[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them out in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This is a tree with an excellent potential as a fruit crop in Britain. The fruit is of very good quality and is freely borne, whilst the tree is of very easy cultivation and rarely troubled by pests or diseases[K]. A tree at the Hillier Arboretum in September 1993 was about 3 metres tall and 1.5 metres wide. The growth looked somewhat weak and the tree was leaning due to wind rock but it was carrying a heavy crop of fruit[K]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers

have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. A very ornamental plant[1], it is very closely related to *C. mollis*, and considered to be part of that species by many botanists[229]. Hybridizes freely with other members of this genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 6.2.9 Prunus persica

Peach, Flowering Peach, Ornamental Peach, Common Peach
5 tlin 9 cyuc 5 kcaak 3 tcan 3 dwat 6 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifkre7t hjonli

drutta Prunus persica is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit Oil Oil SeedEdible Uses: Gum Oil Oil TeaFruit - raw, cooked or dried for later use[1, 2, 34, 46]. The fruit is often used in ice creams, pies, jams etc[183]. When fully ripe, the fruit of the best forms are very juicy with a rich delicious flavour[K]. Wild trees in the Himalayas yield about 36.5kg of fruit a year[194]. The fruit of the wild form contains about 5.2% sugars, 2% protein, 1.6% ash. Vitamin C content is 2.3mg per 100g[194]. The fruit is a good source of vitamin A[201]. Fruits of the wild peach are richer in nutrients than the cultivated forms[194]. The size of fruit varies widely between cultivars and the wild form, it can be up to 7cm in diameter and contains one seed[200]. Flowers - raw or cooked. Added to salads or used as a garnish[183]. They can also be brewed into a tea[183]. The distilled flowers yield a white liquid which can be used to impart a flavour resembling the seed[183]. Seed - raw or cooked. Do not eat if it is too bitter, seed can contain high concentrations of hydrocyanic acid. See the notes above on toxicity. A semi-drying oil is obtained from the seed[57]. Although the report does not mention edibility it can be assumed that it is edible. The seed contains up to 45% oil[218]. A gum is obtained from the stem. It can be used for chewing[64].

tcanta Adhesive Cleanser Dye Gum Oil OilA green dye can be obtained from the leaves[168]. Yellow according to another report[257]. A dark grey to green dye can be obtained from the fruit[168]. A semi-drying oil is obtained from the seed[57]. It is used as a substitute for almond oil in skin creams[238]. The bruised leaves, when rubbed within any container, will remove strong odours such as garlic or cloves so long as any grease has first been fully cleaned off[4]. A gum obtained from the stem is used as an adhesive[64].

dwatta Alternative Anthelmintic Antiasthmatic Antihalitosis Antitussive Astringent Demulcent Diuretic Emollient Expectorant Febrifuge Haemolytic Laxative Sedative Vitamin CAntihalitosis[194]. The leaves are astringent, demulcent, diuretic, expectorant, febrifuge, laxative, parasiticide and mildly sedative[21, 218]. They are used internally in the treatment of gastritis, whooping cough, coughs and bronchitis[238]. They also help to relieve vomiting and morning sickness during pregnancy, though the dose must be carefully monitored because of their diuretic action[21]. The dried and powdered leaves have sometimes been used to help heal sores and wounds[21]. The leaves are harvested in June and July then dried for later use[4]. The flowers are diuretic, sedative and vermifuge[4, 21, 176, 194, 218]. They are used internally in the treatment of constipation and oedema[238]. A gum from the stems is alternative, astringent, demulcent and sedative[4, 21, 176, 194, 218]. The seed is antiasthmatic, antitussive, emollient, haemolytic, laxative and sedative[4, 21, 176, 194, 218]. It is used internally in the treatment of constipation in the elderly, coughs, asthma and menstrual disorders[238]. The bark is demulcent, diuretic, expectorant and sedative[4]. It is used internally in the treatment of gastritis, whooping cough, coughs and bronchitis[238]. The root bark is used in the treatment of dropsy and jaundice[218].

The bark is harvested from young trees in the spring and is dried for later use[4]. The seed contains 'laetrial', a substance that has also been called vitamin B17[218]. This has been claimed to have a positive effect in the treatment of cancer, but there does not at present seem to be much evidence to support this[K]. The pure substance is almost harmless, but on hydrolysis it yields hydrocyanic acid, a very rapidly acting poison - it should thus be treated with caution[218]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. The stored seed is best given 2 months warm followed by 3 months cold stratification[113]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. A very low percentage[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Landscape Uses:Container, Espalier, Firewood. Requires a well-drained moisture retentive soil[1, 11]. Thrives in a loamy soil, doing well on limestone[11]. Best not grown in acid soils. Prefers some chalk in the soil but it is apt to become chlorotic if too much is present[1]. Prefers a pH in the range 6 to 7[200]. Succeeds in light shade but fruits better in a sunny position[11]. Requires shelter from north and north-east winds[11] and also from spring frosts[200]. Widely cultivated for its edible fruit in warm temperate areas and continental climates, there are many named varieties[183]. There are numerous divisions of the varieties according to skin colour etc. Perhaps the most useful from the eaters point of view is whether it is free-stone (the flesh parts easily from the seed) or cling-stone (the flesh adheres to the seed)[200, K]. Trees are normally hardy in southern Britain[11], tolerating temperatures down to about -20°C when they are dormant[184], but they require some protection if cropping is to be at all reliable[11]. This is not due so much to lack of cold hardness, more to the cooler summers in Britain which do not fully ripen the wood and the fruit, plus the unpredictable winters and springs which, in a mild spell, can excite the tree into premature flowering and growth which is then very liable to damage in any following cold spell. Hand pollination at this time can improve fruit-set[200]. The cultivar 'Rochester' is more likely than most cultivars to succeed outdoors in Britain[200]. In general it is best to site peaches in a very warm sheltered sunny position, preferably against a south or west facing wall[200, 219]. Most cultivars are self-fertile[200]. Trees are often grafted onto plum or other rootstocks but are said to be better when grown on their own roots in southern Britain[11]. Trees are not generally long-lived[200], this is partly because of the need for the tree to produce a constant supply of new wood since most fruit is formed on one-year old wood (though some fruit spurs are formed)[200]. Garlic is a good companion for this plant, helping to prevent disease, especially peach leaf curl[20, 201]. Tansy grown below peach trees helps to keep them healthier[201]. Peach leaf curl can also be prevented by protecting the plants from winter and early spring rains, perhaps by covering them in plastic[200]. Plants grown or overwintered indoors do not suffer from leaf curl[260]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Edible, Not North American native, All or parts of this plant are poisonous, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture

(form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface. The root pattern is suckering with new plants from runners away from the plant [2-1].

## 6.2.10 Crataegus ellwangeriana

Scarlet Hawthorn

5 tin 7 cyuc 5 kcaak 2 tcan 2 dwat 6 m hkuc  
hmmihut cyutli hqattcuphia7n hwicli hrasjlutnyik frip hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus ellwangeriana is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midgees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Juicy and acid[82]. An excellent dessert fruit, it has an acid yet sweet flavour, is juicy but with a mealy texture, it makes very pleasant eating[K]. The fruit can also be used in making pies, preserves etc. and can be dried for later use. A reasonable size, it is about 15mm in diameter[200]. A specimen at Kew has fruits up to 25mm in diameter[K]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit,

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Grows well on chalk[98], even when the soil is shallow[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Grows well near the coast[98]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. A very ornamental tree[1], it grows very well in Britain and is the fastest growing of the oaks in cultivation in this country[1]. The seed ripens in its second year[200]. Trees transplant badly unless they are moved regularly[11]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200].

## 6.2.79 Ulmus procera

English Elm

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 35 m hkuc  
hmmihut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Ulmus procera is a deciduous Tree growing to 35 m (114ft) by 15 m (49ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from February to March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Fruit Inner bark LeavesEdible Uses: TeaLeaves - raw or cooked[2, 179, K]. They can be a little bit bitter, especially if not very young, and have a mucilaginous texture[K]. They make a nice addition to a mixed salad[K]. Immature fruits, used just after they are formed - raw[2, 177]. An aromatic, unusual flavour, leaving the mouth feeling fresh and the breath smelling pleasant[132]. They contain about 34.4% protein, 28.2% fat, 17% carbohydrate, 5% ash[179]. Inner bark - cooked. A mucilaginous texture[179]. It can be dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[2, 177]. A tea is made from the leaves[177].

tcanta Dye Tannin WoodA fibre from the inner bark is very tough[4]. It is used for making mats and ropes[4]. Tannin and a dyestuff are obtained from the inner bark[7]. No details of the colour are given. Wood - close-grained, free from knots, very durable under water, fairly hard, elastic, withstands abrasion and salt water, but does not take a high polish. It is used for water pipes, wheels, mallet heads, ships keels etc[4, 7, 11] and is a good firewood[6].

dwatta Astringent Bach Demulcent Diuretic Eczema Homeopathy Mouthwash Resolvent Skin Tonic VulneraryThe dried inner bark is anti-inflammatory, astringent, demulcent, mildly diuretic, resolvent, tonic and vulnerary[4, 7, 9]. It is used both internally and externally in the treatment of diarrhoea, rheumatism, wounds, piles etc and is also used as a mouthwash in the treatment of ulcers[4, 9, 66]. The inner bark is harvested from branches 3 - 4 years old and is dried for later use[9]. The sap has been used in the treatment of baldness[7]. The leaves are astringent and have been powdered then used in the treatment of haemorrhoids[7]. A decoction is used to treat reddened and inflamed skin as well as to relieve various skin disorders[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Occasional feelings of inadequacy', 'Dependancy' and 'Exhaustion from over-striving for perfection'[209]. A homeopathic remedy is made from the inner bark[4]. It is used as an astringent[4] and as a treatment for eczema[9].

propta Seed - if sown in a cold frame or outdoor seedbed as soon as ripe it usually germinates in a few days. A high proportion of the seed is not viable but seed is normally freely produced and can be sown thickly to take into account the poor viability. Stored seed does not germinate so well and should be sown in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots.

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. Tolerant of atmospheric pollution[4]. The English elm is susceptible to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. Mature trees killed back by the disease will often regrow from suckers, but these too will succumb when they get larger. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant to the disease so the potential exists to develop new resistant hybrids with the native species[200]. The various species hybridize freely, the pollen stores well and can be kept for use with species that flower at different times[200]. A food plant for the caterpillars of many lepidoptera species[30], there are 80 species of insects associated with this tree[24]. A good tree for growing grapes into[18].

## 6.2.80 Carya ovalis

Sweet Pignut

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 30 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyif hjonli

drutta Carya ovalis is a deciduous Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Sap SeedEdible Uses: Seed - raw or cooked[1, 101, 105]. Small but sweet[11, 82] with a thin shell[159, 235]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. Sap - raw. Tapped in the spring, it has a sweet flavour[101].

tcanta Fuel WoodWood - heavy, hard, tough and elastic. Used for making wagons, agricultural implements, tool handles etc[63, 82].

dwatta None known

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. Considered by some botanists to be no more than a form of *C. glabra*[101], this tree is more regular cropping than other species[159]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method



kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 105]. Eaten in early September, the fruit was not quite ripe but had already developed a pleasantly sweet flavour and a mealy texture, it made a very acceptable dessert fruit[K]. The fruit is about 10mm in diameter and is produced in fairly large clusters that make harvesting quite simple[K]. It is usually bled if it is going to be eaten raw[K]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit[K]. The fruit is up to 8mm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. A tetraploid species, it is closely related to *S. intermedia* and *S. latifolia*[200]. Very similar to *S. anglica*[11]. The trees usually have apomictic flowers. They thus produce seed asexually, each seedling being a clone of the parent[11].

## 6.2.77 Apium graveolens rapaceum

Celeriac

5 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikwisslip hpa7tmwatli fyfxre7t hjonli

drutta Apium graveolens rapaceum is a BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: CondimentLeaves - used as a flavouring in soups etc[200]. They can be eaten raw but have a very strong flavour[52]. Seed - a flavouring. An essential oil from the seed is also used as a flavouring. Root - raw or cooked[27, 33, 52]. It can be grated and added to salads, baked or added to soups, stews etc[183].

tcanta The growing plant is an insect repellent, it repels the cabbage white butterfly so is a good companion for brassicas[20].

dwatta Aperient Carminative Diuretic Emmenagogue Galactagogue Nerve Stimulant TonicAlthough not as medicinally active as wild celery, the cultivated forms of celery also have the same medicinal properties and, when used as an item of the diet, will have a similar effect upon the body. These medicinal uses are as follows:- Wild celery is an aromatic bitter tonic herb that reduces blood pressure, relieves indigestion, stimulates the uterus and is anti-inflammatory[238]. The ripe seeds, herb and root are aperient, carminative, diuretic, emmenagogue, galactagogue, nerve stimulant and tonic[4, 7, 21, 165]. Wild celery is said to be useful in cases of hysteria, promoting restfulness and sleep and diffusing through the system a mild sustaining influence[4]. The herb should not be prescribed for pregnant women[238]. Seeds purchased for cultivation purposes are often dressed with a fungicide, they should not be used for medicinal purposes[238]. The root is harvested in the autumn and can be used fresh or dried[238]. The whole plant is harvested when fruiting and is usually liquified to extract the juice[238]. The seeds are harvested as they ripen and are dried for later use[238]. An essential oil obtained from

the plant has a calming effect on the central nervous system. Some of its constituents have antispasmodic, sedative and anticonvulsant actions. It has been shown to be of value in treating high blood pressure[254]. A homeopathic remedy is made from the herb[9]. It is used in treating rheumatism and kidney complaints[9].

propta Seed - surface sow February in a greenhouse. The maincrop can be sown as late as mid-April. Germinates in 2 - 3 weeks at 15°C. Plant out in May. The seed can harbour certain diseases of celery, it is usually treated by seed companies before being sold but if you save your own seed you should make sure that only seed from healthy plants is used[1].

nwatta Prefers a rich moist soil and an open sunny situation[1, 27, 33, 52]. Requires abundant moisture in the growing season otherwise the root will be small and tough[1]. Tolerates a pH in the range 5.2 to 8.3. The root is hardy to about -12°C and can be left in the ground over winter, to be harvested as required[200]. Roots can also be stored in boxes of sand or other such material in a cool dry shed[200]. Celeriac is a form of *A. graveolens* that has been selected for its enlarged edible root. It is occasionally cultivated commercially but more often in the garden or allotment[46, 200], there are some named varieties[183]. Any side-shoots should be removed in order to encourage a larger root[200]. A good companion plant for leeks, tomatoes, French beans and brassicas[18].

## 6.2.78 Quercus cerris

Turkey Oak, European turkey oak

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 35 m hkuc  
hmimhtut cyutli tcup hwicli jlutnykfrp hpa7tli flatprikwisslip hpa7tmwatli hjonli

drutta Quercus cerris is a deciduous Tree growing to 35 m (114ft) by 25 m (82ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Manna SeedEdible Uses: CoffeeSeed - cooked. Up to 2.5cm long. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute. A sweet fluid exudes from insect damage on the stems and solidifies[2, 61, 105, 177]. This is edible and is sold as a manna in local markets in Iran[46]. It can be boiled down into a syrup and used for sweetening food[183].

tcanta Buttons Repellent Tannin WoodThe seed cups are used as buttons[95]. A mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit the growth of young plants[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The leaves, bark and wood are used commercially as a source of tannins[223]. Wood. It is valued by wheelwrights, turners and cabinet makers[4]. Of little value[1, 11]. It does not weather well[100].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. This species is possibly of hybrid origin, involving *C. pedicellata*, though some botanists view it as no more than part of *C. pedicellata*[82]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant[11].

## 6.2.11 Prunus insititia

Damson

5 tin 9 cyuc 5 kcaak 3 tcan 1 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Prunus insititia is a deciduous Tree growing to 6 m (19ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[1, 2, 46]. More acid than a plum but it is very acceptable raw when fully ripe, especially after being touched by frost[12, 34, K]. The fruit is about 3cm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye Hedge Hedge ShelterbeltA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Trees are fairly wind resistant and can be grown as a shelterbelt hedge[200].

dwatta Febrifuge Purgative StypticThe bark of the root and branches is febrifuge and considerably styptic[4]. An infusion of the flowers has been used as a mild purgative for children[4]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Requires a well-drained moisture retentive soil[1, 11]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Grows well in heavy clay soils. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. Occasionally cultivated for its edible fruit, there are some named varieties[200]. It has been derived in cultivation from the bullace, differing in having a sweeter fruit[200]. Damsons can be grown successfully against a north facing wall[219]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. *Prunus insititia* L. is a synonym of *Prunus domestica* subsp. *insititia* (L.) Bonnier and Layens For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given

here if available. A sprouting standard sending up shoots from the base [1-2].

## 6.2.12 Crataegus schraderana

Blue hawthorn

5 tin 9 cyuc 5 kcaak 0 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnykfrp hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus schraderana is a deciduous Tree growing to 6 m (19ft 8in). It is not frost tender. It is in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Fruit - raw or cooked[74]. A reasonable size, about 15 - 20mm in diameter[K]. This is one of the nicest tasting fruits of the genus I have tried to date. When fully ripe it is juicy with an extremely pleasant flavour and almost literally melts in the mouth[K]. I would far rather eat this fruit than a strawberry[K]. It ripens in late September and hangs on the tree in good condition for at least 4 weeks[K]. The ripe fruit is so soft that it is best eaten fresh from the tree[K]. The fruit can also be used in making pies, preserves etc, and can be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This species has an excellent potential as a fruit crop in Britain. The fruit is about the size of a cherry, it is very freely borne and the best forms are of excellent dessert quality[K]. The tree is very easily grown

and is little troubled by pests or diseases. It also requires very little attention, once the trees are established virtually the only work needed is to harvest the fruit each year[K]. Grafted specimens can produce fruit in their third year[K]. A very ornamental plant[74], it grows well in Britain flowering and fruiting well at Kew and Wisley[K]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Hybridizes freely with other members of this genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 6.2.13 Prunus domestica italica

Gages, Greengage  
5 tlin 8 cyuc 5 kcaak 2 tcan 2 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprikliw  
wisslip hpa7tmwatli hjonli

drutta Prunus domestica italica is a deciduous Tree growing to 5 m (16ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Fruit Oil SeedEdible Uses: OilFruit - raw or cooked. Often considered to be the finest of the dessert plums, they have a delicious flavour[K].The greengages. The usually green, globose fruit is usually 30 - 400mm in diameter. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity. An edible gum is obtained from points of damage on the trunk[64]. The seed contains about 20% of an edible semi-drying oil[4, 57]. It has an agreeable almond smell and flavour[4]. The flowers are eaten. They are used as a garnish for salads and ice cream or brewed into a tea[183].

tcanta Adhesive Cosmetic Dye Oil WoodA green dye can be obtained from the leaves [168]. A dark grey to green dye can be obtained from the fruit [168]. A yellow dye is obtained from the bark [115]. A gum obtained from points of damage along the stem can be used as an adhesive [64]. The ground up seeds are used cosmetically in the production of face-masks for dry skin [7]. A semi-drying oil is obtained from the seed [64]. No details of its uses. The reddish-brown wood is very close-grained, hard, compact. Liable to warp and split. It is used for musical instruments [115, 146].

dwatta Digestive Febrifuge Laxative Purgative Stomachic StypticThe dried fruit, known as prunes, is a safe and effective laxative and is also stomachic [4, 7, 21, 238]. The bark is sometimes used as a febrifuge and is styptic [4, 7]. An infusion of the flowers has been used as a mild purgative for children [4]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being [238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe [200]. Sow stored seed in a cold frame as early in the year as possible [200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate [113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. The various cultivars of plum are unlikely to breed true (though the green forms of the gage generally do) - they will usually produce a range of plants from seed with differing characteristics from their parent, Cuttings of half-ripe wood with a heel, mid summer in a frame [11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame [200]. Layering in spring.

nwatta The greengages are a group of cultivars of the common European plum. Gages are often cultivated as a fruit crop, especially in western Europe. Of excellent quality, though their delicate skins makes it difficult to get them to market in good condition and so they are more likely to be grown on a garden scale or be used for canning etc. Prunus domestica subsp. italica requires a well-drained moisture retentive soil [1, 11]. Succeeds in light shade but fruits better in a sunny position [11, 200]. Thrives in a loamy soil, doing well on limestone [11]. Grows well in heavy clay soils. Prefers some chalk in the soil but apt to become chlorotic if too much is present [1]. The various gages are often cultivated for their edible fruits, especially on a garden scale. There are some named varieties [200]. The gage was first developed from the plum in the Middle East, later spreading via France into much of western Europe. Its cultivation has spread into most temperate regions, though it is often only grown on a small scale because of the difficulty of getting it to market in good condition. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged [238]. Plants in this genus are notably susceptible to honey fungus [200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1]. Prunus domestica italica is a deciduous shrub or a tree usually growing 2 - 6 metres tall, occasionally to 15 metres. We can infer from its cultivation that the species grows optimally in areas with cold winters and long warm summers as vernalisation is required for flowering. The species can tolerate frost, however, when this occurs after flowering the fruit quality is poor (Lim 2002). Widely grown cultivars include: Boddarts Reneklode (Germany), Bryanston (UK), Cambridge Gage (UK), Canerik (Turkey), Denniston's Superb (USA), Gojeh Sabz (Iran), Yasil Alca or Goy Alca (Azerbaijan), Golden Transparent (UK), Graf Althanns Reneklode (Germany), Green Vanilla (Mount Pelion, Greece), Große Grüne Reneklode (Germany) / Reine Claude Verte (France), Laxton's Gage (UK), Laxton's Supreme (UK), Meroldts Reneklode (Germany), Rainha Cláudia (Portugal), Regina Claudia (Italy), Reine Claude de Bavay (France), Reine Claude d'Oullins (France), Uhinks Reneklode (Germany), Washington (USA).

## 6.2.14 Rubus fruticosus

Blackberry, Shrubby blackberry  
5 tlin 9 cyuc 5 kcaak 2 tcan 3 dwat 3 m hkuc  
pcimhmimhtut cyutli hgattcup hwicli hyishrasjlutnyik hpa7tli  
frusflatprikliwsslip hpa7tmwatli fyfjxre7t hjonli

drutta Rubus fruticosus is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from March to November, in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit Leaves Root ShootsEdible Uses: TeaFruit - raw or cooked[5, 7, 9, 12, 183]. The best forms have delicious fruits and, with a range of types, it is possible to obtain ripe fruits from late July to November[K]. The fruit is also made into syrups, jams and other preserves[238]. Some people find that if they eat the fruit before it is very ripe and quite soft then it can give them stomach upsets[K]. Root - cooked. The root should be neither to young nor too old and requires a lot of boiling[7]. A tea is made from the dried leaves[21] - the young leaves are best[61]. The leaves are often used in herbal tea blends[238]. Young shoots - raw. They are harvested as they emerge through the ground in the spring, peeled and then eaten in salads[244].

nectar and are very attractive to honey bees[200], the plant also attracts butterflies[4, 7, 24]. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Suitable for dried flowers. Heat Zone 9-1.

## 6.2.75 Salvia officinalis

Sage, Kitchen sage, Small Leaf Sage, Garden Sage  
5 tlin 10 cyuc 4 kcaak 5 tcan 5 dwat 0.6 m hkuc  
htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli prikliwsslip  
hpa7tmwatli xre7t hjonli

drutta Salvia officinalis is an evergreen Shrub growing to 0.6 m (2ft) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaLeaves and flowers - raw or cooked[2, 14, 27, 46, 52]. A very common herb, the strongly aromatic leaves are used as a flavouring in cooked foods[183]. They are an aid to digestion and so are often used with heavy, oily foods[244]. They impart a sausage-like flavour to savoury dishes. The young leaves and flowers can be eaten raw, boiled, pickled or used in sandwiches[183]. The flowers can also be sprinkled on salads to add colour and fragrance[183]. A herb tea is made from the fresh or dried leaves[183], it is said to improve the digestion[13, 21]. An essential oil obtained from the plant is used commercially to flavour ice cream, sweets, baked goods etc[61, 183].

tcanta Compost Essential Repellent Strewing TeethThe leaves make excellent tooth cleaners[14, 21], simply rub the top side of the leaf over the teeth and gums[K]. The purple-leafed form of sage has tougher leaves and is better for cleaning the teeth[K]. The leaves have antiseptic properties and can heal diseased gums[201]. An essential oil from the leaves is used in perfumery, hair shampoos (it is good for dark hair) and as a food flavouring[14, 57, 61]. It is a very effective 'fixer' in perfumes[7], and is also used to flavour toothpastes and is added to bio-activating cosmetics[238]. The plant (the flowers?) is an alternative ingredient of 'QR' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The growing or dried plant is said to repel insects, it is especially useful when grown amongst cabbages and carrots[14, 18, 20, 201]. It was formerly used as a stewing herb[201] and has been burnt in rooms to fumigate them[244]. A good dense ground cover plant for sunny positions, though it needs weeding for the first year or two[197]. They are best spaced about 60cm apart each way[208].

dwatta Anti diarrhoeal Antihydrotic Antiseptic Antispasmodic Appetizer Aromatherapy Astringent Carminative Cholagogue Galactofuge Stimulant Tonic VasodilatorSage has a very long history of effective medicinal use and is an important domestic herbal remedy for disorders of the digestive system. Its antiseptic qualities make it an effective gargle for the mouth where it can heal sore throats, ulcers etc[K]. The leaves applied to an aching tooth will often relieve the pain[4, K]. The whole herb is antihydrotic, antiseptic, antispasmodic, astringent, carminative, cholagogue, galactofuge, stimulant, tonic and vasodilator[4, 9, 13, 21, 165, 238]. Sage is also used internally in the treatment of excessive lactation, night sweats, excessive salivation (as in Parkinson's disease), profuse perspiration (as in TB), anxiety, depression, female sterility and menopausal problems[238]. Many herbalists believe that the purple-leafed forms of this species are more potent medicinally[238]. This remedy should not be prescribed to pregnant women or to people who have epileptic fits[238]. The plant is toxic in excess or when taken for extended periods[238] - though the toxic dose is very large. Externally, it is used to treat insect bites, skin, throat, mouth and gum infections and vaginal discharge[238]. The leaves are best harvested before the plant comes into flower and are dried for later use[4]. The essential oil from the plant is used in small doses to remove heavy collections of mu-

cous from the respiratory organs and mixed in embrocations for treating rheumatism[4]. In larger doses, however, it can cause epileptic fits, giddiness etc[4]. The essential oil is used in aromatherapy. Its keyword is 'Tonic'[210]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Salvia officinalis* Sage for loss of appetite, inflammation of the mouth, excessive perspiration (see [302] for critics of commission E).

propta Seed - sow March/April in a greenhouse[1]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of heeled shoots, taken off the stem in May and planted out directly into the garden grow away well[182]. Cuttings of half-ripe wood, 5 - 10cm with a heel, June to August in a frame[78]. Easy. Cuttings of mature wood, 7 - 10cm with a heel, November/December in a cold frame[78]. Layering in spring or autumn. Mound soil up into the plants, the branches will root into this soil and they can be removed and planted out 6 - 12 months later.

nwatta Landscape Uses:Border, Container, Massing, Rock garden, Seashore, Specimen. Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a calcareous soil[4, 14]. Dislikes heavy or acid soils[1, 16]. Succeeds in dry soils, tolerating drought once it is established[190]. Sage can be killed by excessive winter wet[200] and winter-planted bushes often die[208]. A very ornamental plant[1], sage is commonly grown in the herb garden for culinary and medicinal purposes. There are some named varieties[182, 183]. 'Albiflora' is said to be the best culinary sage[11]. 'Purpurea' has tougher leaves than the type and makes a better tooth cleaner[K]. Plants need to be trimmed in late spring in order to keep them compact[200]. They tend to degenerate after a few years and are best replaced after about 4 years[4]. The leaves emit a unique pungent aroma when pressed[245]. A good companion for many plants, including rosemary, cabbages and carrots[14, 18, 20, 54], the growing plant is said to repel insects. It is inhibited by wormwood growing nearby and dislikes growing with basil, rue or the cucumber and squash family[14, 18, 20, 54]. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Suitable for cut flowers. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. An evergreen. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2].

## 6.2.76 Sorbus mougeotii

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw  
hpa7tmwatli fyfjxre7t hjonli

drutta Sorbus mougeotii is a deciduous Tree growing to 18 m (59ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. A very ornamental plant, this sub-species is widely cultivated for its edible fruit in China[266], it is larger than the type species[46, 178, 200].

### 6.2.73 Actinidia melanandra

Red Kiwi

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwattli nyanhjen hjonli

drutta Actinidia melanandra is a deciduous Climber growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[126, 183]. The globose fruit is hairless when fully ripe and up to 45mm long[183, 198, 266]. It contains a number of small seeds, but these are easily eaten with the fruit[K].

tcanta None known  
dwatta None known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. One report says that plants are not fully hardy in the colder parts of the country[219]. Young spring growth is susceptible to frost damage[160]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. The flowers have a soft, aromatic perfume[245]. This is a climbing plant, supporting itself by twining around branches etc[200]. At least one named variety has been developed for its edible fruit[183]. Plants have been seen in fruit at Kew[11]. This species is a good pollinator for *A. arguta cordifolia*[183]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Another report says that both sexes are on one plant[182].

### 6.2.74 Thymus serpyllum

Wild Thyme

5 tlin 9 cyuc 4 kcaak 5 tcan 3 dwat 0.1 m hkuc htut cyutli kyuctup hwicli hrasljut hpa7tli flatprikliw hpa7tmwattli xre7t hjonli

drutta Thymus serpyllum is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year; in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: TeaLeaves - raw in salads or added as a flavouring to cooked foods[2, 11, 46, 61]. Thyme retains its flavour well in long slow cooking. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200]. An aromatic tea is made from the leaves[21].

tcanta Deodorant Disinfectant Disinfectant Essential Fungicide RepellentAn essential oil from the leaves and flowering tops is used in perfumery, soaps, medicinally etc. It has fungicidal and disinfectant properties[4, 7]. About 150 grams of oil are obtained from 100 kilos of plant material[4]. The dried flowers are used to repel moths from clothing[4]. The growing plant is said to repel cabbage root fly[18, 20]. A good ground cover for a sunny position[197]. It needs weeding for the first year or so[197]. Plants are best spaced about 45cm apart each way[208]. Plants are only satisfactory when young or growing luxuriantly - they are apt to become bare in patches otherwise[208]. Summer flowers bring bees. Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wild-fires, these are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level groundcovers provide little fuel.

dwatta Anthelmintic Antirheumatic Antiseptic Antispasmodic Carminative Deodorant Diaphoretic Disinfectant Disinfectant Expectorant Sedative TonicWild thyme is a commonly used domestic remedy, being employed especially for its antiseptic properties and its beneficial effect on the digestive system. The whole plant is anthelmintic, strongly antiseptic, antispasmodic, carminative, deodorant, diaphoretic, disinfectant, expectorant, sedative and tonic[4, 165, 200, 238, 254]. It is taken internally in the treatment of bronchitis, catarrh, laryngitis, flatulent indigestion, painful menstruation, colic and hangovers[238]. It is said to be effective in treating alcoholism[238]. It should not be prescribed for pregnant women[238]. Externally, it is applied to minor injuries, mastitis, mouth, throat and gum infections etc[238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238]. The seeds are used as a vermifuge[240]. Wild thyme contains all the medicinal properties of the more commonly used garden thyme (*T. vulgaris*), though in a lesser degree[4]. An essential oil distilled from the leaves is used in the treatment of stress-related conditions, though it can cause allergic reactions[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Landscape Uses:Container, Ground cover, Rock garden, Seashore. Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils[4]. Grows well between stepping stones on paths, tolerating light treading[183, 200]. Succeeds on walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -15°C[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200]. This species is harvested commercially for its essential oil, known as 'wild thyme'[218]. Closely related to *T. praecox* arcticus, but this species is not so common in Britain[11]. It is a very polymorphic plant. A good companion for most other plants[54], it makes a very good carpeting plant for the rockery or between paving stones[1] and can also be grown in a short lawn[54]. The flowers are rich in

tcanta Dye Fibre PioneerA purple to dull blue dye is obtained from the fruit[168]. A fibre is obtained from the stem and used to make twine[66]. Plants are spread by seed deposited in the droppings of birds and mammals. They often spring up in burnt-over, logged or abandoned land and make an excellent pioneer species, creating the right conditions for woodland trees to move in. The trees will often grow in the middle of a clump of blackberries, the prickly stems protecting them from rabbits[K].

dwatta Antidiarrhoeal Astringent Depurative Diuretic Dysentery Tonic VulneraryThe root-bark and the leaves are strongly astringent, depurative, diuretic, tonic and vulnerary[4, 7, 9, 165, 254]. They make an excellent remedy for dysentery, diarrhoea, haemorrhoids, cystitis etc, the root is the more astringent[4, 238]. Externally, they are used as a gargle to treat sore throats, mouth ulcers and gum inflammations[238, 254]. A decoction of the leaves is useful as a gargle in treating thrush and also makes a good general mouthwash[7].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil[1, 11, 200]. Succeeds in acid and calcareous soils[186]. Tolerates poor soils[202]. Established plants are drought resistant[132]. Succeeds in sun or semi-shade[1, 11, 200], though it fruits less well in the shade[202]. Plants will also fruit when grown in fairly deep shade or against a north facing wall, though the fruit will ripen later[219]. Plants tolerate quite severe exposure[186]. Hardy to at least -18°C[202]. *R. fruticosus* is an aggregate species made up of several hundred slightly differing species. The reason for this is that most seed is produced by a non-sexual method (Apomixis) and is therefore genetically identical to the parent plant. On occasions when sexual production of seed takes place the offspring will all be slightly different from the parent plant and will then usually reproduce as a new species by means of apomixis. Modern treatment of this aggregate usually does not use the name *R. fruticosus* because of the confusion over which species it should apply to, the type species of the aggregate should be called *R. ulmifolius*[150]. The following members of the aggregate have been highly recommended for their fruit[150]. *R. badius*. *R. cyclophorus*. *R. gratus*. *R. nemoralis*. *R. oxyanchus*. *R. pyramidalis*. *R. separinus*. *R. winteri*. The following members are said to be nearly as good. *R. balfourianus*. *R. broensis*. *R. carpinifolius*. *R. foliosus*. *R. fuscoviridis*. *R. infestus*. *R. insericatus newbouldianus*. *R. koehleri*. *R. largificus*. *R. lindinensis*. *R. ludensis*. *R. macrophyllus*. *R. obscurus*. *R. pseudo-bifrons*. *R. rhombifolius*. *R. riddelsdellii*. *R. scaber*. *R. thyrsiflorus*. *R. vallisparvus*. *R. vestitus*. Plants form dense thickets and this makes excellent cover for birds[186]. They regenerate freely after being cut back[186]. This species is also a good plant for bees and butterflies[24]. This species has biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 6.2.15 Ribes x culverwellii

Jostaberry

5 tlin 9 cyuc 5 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwattli xre7t hjonli

drutta Ribes x culverwellii is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from April to October, in flower from

April to May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, jams etc[200]. Intermediate in size and flavour between gooseberries and blackcurrants, tasting more like a gooseberry when under-ripe and more like a blackcurrant when fully ripe[K]. The fruit is rich in vitamin C[183].

tcanta None known

dwatta Vitamin CNone known  
propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. This plant is a cultivar and will not breed true from seed. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Best grown on a deep sandy loam[1]. Dislikes very heavy clay, chalky soils and thin dry soils, but it can succeed on most soil types if plenty of organic matter is incorporated[1]. Quite tolerant of shade though not fruiting so well in such a position[11]. A group of cultivars of hybrid origin, basically a cross between blackcurrants and gooseberries. Very vigorous plants, producing prolific crops of fruit. They are being grown increasingly in gardens. In general they resist American gooseberry mildew, blackcurrant leaf spot and gall mite. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multi-stemmed with multiple stems from the crown [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 6.2.16 Allium ampeloprasum

Wild Leek, Broadleaf wild leek

5 tlin 9 cyuc 5 kcaak 2 tcan 3 dwat 1.8 m hkuc htut cyutli kyuctup hwicli hrasljutnyikrip hpa7tli flatprikliw hpa7tmwattli xre7t hjonli

drutta Allium ampeloprasum is a BULB growing to 1.8 m (6ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from October to August, in flower from July to August, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[2, 27, 61, 105]. The small bulbs can vary considerably in size from 2 - 6cm[200], they have a fairly strong leek to garlic flavour and are nice as a flavouring in cooked foods[K]. The bulbs of selected cultivars are very large with a mild garlic flavour[183]. Leaves - raw or cooked[2]. A pleasant mild to strong garlic flavour, they are available from late autumn to the spring though they can become rather tough and fibrous as they get older[K]. Flowers - raw. A similar flavour to the leaves but they have a somewhat dry texture and are best used as a flavouring in cooked foods[K]. The bulbs have a mild garlic flavour and make a nice flavouring in salads and cooked foods. Although produced abundantly, they are quite fiddly to use because they

are small[K]. They can also be pickled[142].

**tcanta Repellent**The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

**dwatta Anthelmintic Anticholagmatic Anticholesterolemic Antiseptic Antispasmodic Chologogue Diaphoretic Diuretic Expectorant Febrifuge Stimulant Stings Stomachic Tonic Vasodilator**This species has the same medicinal virtues as garlic, but in a much milder and less effective form[238]. These virtues are as follows:- Garlic has a very long folk history of use in a wide range of ailments, particularly ailments such as ringworm, Candida and vaginitis where its fungicidal, antiseptic, tonic and parasitidal properties have proved of benefit[218]. It is also said to have anticancer activity[218]. Daily use of garlic in the diet has been shown to have a very beneficial effect on the body, especially the blood system and the heart. For example, demographic studies suggest that garlic is responsible for the low incidence of arteriosclerosis in areas of Italy and Spain where consumption of the bulb is heavy[222]. The bulb is said to be anthelmintic, antiasthmatic, anticholesterolemic, antiseptic, antispasmodic, chologogue, diaphoretic, diuretic, expectorant, febrifuge, stimulant, stomachic, tonic, vasodilator[4, 9, 14, 21, 46, 165]. The crushed bulb may be applied as a poultice to ease the pain of bites, stings etc[4, 9, 14, 21].

**propta Seed** - best sown as soon as it is ripe in a cold frame, though it can also be sown in a cold frame in the spring[200]. Prick out the seedlings into individual pots when they are large enough to handle. Well-grown plants can be planted out into their final positions in late summer or the autumn, otherwise grow them on for a further year in pots and plant them out the following summer. Division in late summer or early autumn. Dig up the bulbs when the plants are dormant and divide the small bulblets at the base of the larger bulb. Replant immediately, either in the open ground or in pots in a cold frame. Bulbils - plant out as soon as they are ripe in late summer. The bulbils can be planted direct into their permanent positions, though you get better results if you pot them up and plant them out the following spring.

**nwatta** Prefers a sunny position in a light well-drained soil[1]. Prefers a dry position[45]. Succeeds in clay soils[203]. Tolerates a pH in the range 5.2 to 8.3. The bulbs should be planted fairly deeply[1]. The wild leek is a rare native of Britain, found only in the south-west and Wales, though it should be hardy in most parts of the country. It comes into growth in the autumn, dying down in the summer, and makes a very pleasant winter leaf, either raw or cooked. It is a rather variable plant, especially in the amount of flowers and bulbils produced. The species produces mainly flowers with almost no bulbils, whilst the sub-species *A. ampeloprasum babbingtonii* (Babbington's Leek) produces lots of bulbils and almost no flowers[17]. The cultivated leek (*A. ampeloprasum porrum*) is believed to have been developed from this plant whilst, in Germany and Italy, other forms have been selected for their edible bulbils[142]. *Allium ampeloprasum* comprises several vegetables, of which the most important ones are: leek, elephant garlic or great-headed garlic, pearl onion, kurrat, Egyptian leek or salad leek, and Persian leek (*Allium ampeloprasum ssp. persicum*). The cultivar 'Perizweibel' is often used, the bulbils are solid rather than made up of layers and are popularly used for making pickles[183]. This cultivar does not set seed[183]. Another cultivated form of this plant produces very large, mild-garlic flavoured bulbs that are up to 500g in weight[183]. They are known as elephant garlic[183]. The wild leek grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 6.2.17 Allium cernuum

Nodding Onion, New Mexican nodding onion  
5 tin 9 cyuc 5 kcaak 2 tcan 2 dwat 0.5 m hkuc

htuc cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

**drutta Allium cernuum** is a BULB growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from February to December, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kcaakta Edible Parts:** Flowers Leaves Root**Edible Uses:** Bulb - raw or cooked[2, 22, 161]. Strongly flavoured[46, 61, 159], it is mainly used as a flavouring[183, K]. The bulb is about 50mm tall and 15mm wide[235]. Leaves - raw or cooked[62, 85, 159]. A delicious, strong-onion flavour; they are very nice in salads[K]. The leaves are available from spring until the autumn and are one of the most favourite onions we are growing on our Cornish trial grounds[K]. Flowers - raw or cooked. A delicious strong onion flavour, somewhat stronger than the leaves especially if the seeds are starting to set[K]. They make a very decorative and tasty addition to the salad bowl[K].

**tcanta Repellent**The juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20]. The juice can be applied to exposed skin in order to repel biting insects[257].

**dwatta Lithontripic Poultice**The whole plant has mild medicinal activity similar to the action of garlic (*Allium sativum*)[222]. It is used specifically as a poultice on the chest for the treatment of respiratory ailments and the juice has been used in the treatment of kidney stones[222]. The juice of the plant is used in treating colds, croup, sore throats etc[257]. A poultice of the plant is applied externally to various infections such as sore throats, sores, swellings, chest and pleurisy pains[257].

**propta Seed** - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

**nwatta** An easily grown plant[203], it prefers a sunny position in a light well-drained soil[1]. Succeeds in clay soils[203]. Established plants are fairly drought tolerant[190]. Plants succeed in maritime gardens[233]. A very ornamental plant, it makes a very decorative edging to flower beds[K]. This species is self-sowing quite freely in our Cornwall garden[K]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203], though this species has tolerated considerable neglect in our Cornwall garden[K]. The cultivar 'Major' is a more vigorous form with larger flower clusters[90]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 6.2.18 Allium fistulosum

Welsh Onion

5 tin 9 cyuc 5 kcaak 2 tcan 2 dwat 0.6 m hkuc  
htuc cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

**drutta Allium fistulosum** is a BULB growing to 0.6 m (2ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July.

times supplied under this name. A good companion for most plants, especially aubergines and sweet peppers[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 6.2.71 Lomatium macrocarpum

Bigsseed Biscuitroot

5 tin 10 cyuc 4 kcaak 2 tcan 2 dwat m hkuc  
htuc cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfxre7t hjonli

**drutta Lomatium macrocarpum** is a PERENNIAL growing to 0.5 m (1ft 8in). The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcaakta Edible Parts:** Root Seed**Edible Uses:** TeaRoot - raw or cooked[257]. A staple food for a number of native North American Indian tribes[257]. The root is usually peeled before being cooked or eaten[257]. It can be dried and ground into a powder and then used to make cakes etc[105, 161, 183]. Seed - raw or cooked. Very nutritious, they can also be ground into a powder[183] and then used with cereal flours when making bread, cakes etc, or be used as a flavouring in soups etc[257]. The seed is very small, but quite easy to harvest[183, K]. A tea can be made from the leaves, stems and flowers[183].

**tcanta Incentse**The root has been dried then burnt as a ceremonial incense[257].

**dwatta Infertility Pectoral Poultice Sedative Tonic**An infusion of the roots has been used as a general strengthener for a weakened patient[257]. The infusion is also used as a treatment for colds, influenza and bronchitis[257]. The root has been chewed and the juice swallowed as a treatment for sore throats[257]. The root has been eaten by childless couples, especially older people, in order to help them conceive[257]. A poultice made from the boiled root has been used to treat swellings[257]. The leaves have been used as a padding in a child's cradle to encourage it to sleep more[257].

**propta Seed** - best sown as soon as it is ripe in a cold frame. Stored seed can be rather slow to germinate, when sown in the spring it usually takes at least 12 months to germinate. Giving it a period of cold stratification might reduce this time. The seedlings need to be pricked out into individual pots as soon as they are large enough to handle, and should be planted out into their permanent positions in the summer. Fresh seed can be sown immediately in situ. Division may be possible in spring or autumn.

**nwatta** We have almost no information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in much of the country. It can be assumed that plants will require a dry to moist but well-drained soil in a sunny position. Polymorphic[60]. This is a taxonomically very difficult genus, many of the species now included in it have at times been included in other genera[60]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 6.2.72 Crataegus pinnatifida major

Chinese Haw

5 tin 9 cyuc 4 kcaak 2 tcan 3 dwat m hkuc  
hmimhtuc cyutli hgattcuphja7n hwicli hrasjlutnyikfrp hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

**drutta Crataegus pinnatifida major** is a deciduous Tree growing to 7.5 m (24ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kcaakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[3, 105, 177]. A pleasant flavour; it is sold in local markets in China[178]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. A good size, it is up to 25mm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood** - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

**dwatta Anticholesterolemic Cardiotoxic Hypotensive Stomachic Vasodilator**The fruits and flowers of hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222]. The fruits are anticholesterolemic, cardiotoxic, stomachic and vasodilator. Their use improves the blood circulation and lowers blood pressure[176]. The fruits are used in the treatment of dyspepsia, stagnation of fatty foods, abdominal fullness, retention of lochia, amenorrhoea, postpartum abdominal pain, hypertension and coronary heart disease[176].

**propta Seed** - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta** A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization.

should be spaced about 45cm apart each way[208].

dwatta Antibacterial Antidote Antiinflammatory Antiphlogistic Antiviral Astringent Depurative Diuretic Dysentery Emmenagogue Febrifuge Hypoglycaemic Laxative Ophthalmic Women's complaintsThe whole plant is antibacterial, antiinflammatory, antimicrobial, antiphlogistic, antiviral, depurative, diuretic, emmenagogue, febrifuge, hypoglycaemic, laxative and ophthalmic[103, 116, 147, 174, 176, 218, 238, 240, 279]. A decoction is used internally in the treatment of many ailments including cancer, coughs, dysentery, enteritis and fever[218]. Its use is said to strengthen the immune system[176]. Externally, it is used in the treatment of snake bites and skin disorders[238]. The leaves and stems are harvested during the growing season and used fresh in decoctions[238]. The leaf juice is antidote and astringent[218]. A root extract is diuretic[218, 240]. The root is also said to be used in medicinal preparations for certain diseases of women[240, 243]. The rhizomes yield a sterol, resembling sitosterol, which stimulates the secretion of antibiotic substances from a gram-positive spore-forming bacillus[240]. An active substance, effective in the treatment of stomach ulcers, has been extracted from the plant[240].

propta Seed - sow spring in a greenhouse. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Division in spring[31, 56]. Very quick and easy, it can be done successfully at almost any time in the growing season[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Foundation, Ground cover, Massing, Woodland garden. Requires a moist to wet soil or shallow water, partial shade and a sheltered position[1, 31, 56, 238]. Whilst it grows best in a bog garden, it will succeed in moist garden borders[233] and has also grown fairly well in a dry soil in Cornwall[K]. It succeeds in full shade[208]. Plants are hardy to about -15°C[187], the top growth is killed back by frost though the roots are much harder. Even the roots, though, can be killed in severe winters[56]. A very ornamental plant, there are some named varieties[187]. 'Chameleon' has very attractively variegated leaves with the same flavour as the species[K]. The bruised leaves emit a strong citrus smell rather like orange peel[K]. Plants have a widely spreading root system and are very invasive, though they are easier to control in drier soils[200]. Creeps harmlessly between ferns[187]. Cultivated as a salad crop in Vietnam[103] and in W. China[187]. Plants seem to be immune to the predations of rabbits[233]. Plants growing in an area with a high rabbit population were not eaten by them although other plants growing nearby were attacked[K]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Invasive, Naturalizing, Wetlands plant, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.70 Artemisia dracunculus

Tarragon, French Tarragon

5 tin 8 cyuc 4 kcaak 3 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli hgaktyuctup hwicli hrasjut hpa7tli prikliwis hpa7tmwatli xre7t hjonli

drutta Artemisia dracunculus is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from

June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kckahta Edible Parts: Leaves ShootsEdible Uses: Condi- mentLeaves - raw or used as a flavouring in soups etc[2, 4, 14, 21, 37]. Tarragon is a commonly used herbal flavouring that is used in many traditional recipes[244]. It is particularly of value because of its beneficial effect upon the digestion and so is often used with oily foods[244]. The leaves can also be harvested in late summer and dried for later use[4]. The aromatic leaves have a very nice flavour that is somewhat liquorice-like[183, K]. They make an excellent flavouring in salads[K]. The young shoots can also be cooked and used as a potherb[183]. The leaves are used as a flavouring in vinegar[4]. An essential oil from the leaves is used as a flavouring[61].

tcanta Essential RepellentThe leaves contain about 0.3% essential oil, about 70% of which is methyl chavicol[240]. This is used as a food flavouring, in detergents and also medicinally[61, 238]. Both the growing and the dried plant repels insects[99]. Landscape Uses: Container, Seashore. Special Features: Edible, Fragrant foliage, Not North American native, Inconspicuous flowers or blooms. Provides shelter for beneficial invertebrates: insects and other arthropods. A specialist nectary plant [1-2].

dwatta Antiscorbatic Appetizer Diuretic Emmenagogue Febrifuge Hypnotic Ondaontic Stomachic VermifugeTarragon is a bitter warming aromatic herb that stimulates the digestive system and uterus, lowers fevers and destroys intestinal worms[238]. It is little used in modern herbalism, though it is sometimes employed as an appetizer[268]. The leaves (and an essential oil obtained from them) are antiscorbatic, diuretic, emmenagogue, hypnotic and stomachic[21, 146, 179, 238]. An infusion is used in the treatment of indigestion, flatulence, nausea, hiccups etc[244]. The plant is mildly sedative and has been taken to aid sleep[254]. It also has mild emmenagogue properties and can be used to induce a delayed period[254]. A poultice can be used to relieve rheumatism, gout, arthritis and toothache[244]. The plant is harvested in the summer and can be dried for later use[238]. This herb should not be prescribed for pregnant women[238]. The root has been used to cure toothache[4]. The essential oil is used in aromatherapy to treat digestive and menstrual problems[238].

propta Seed - surface sow from late winter to early summer in a greenhouse. Fertile seed is rarely produced from this plant - most if not all seed supplied under this name is of the inferior form, Russian tarragon (*A. dracunculoides*). Therefore, it is best to only propagate by division. Division is very easy in spring or autumn[K]. The divisions can be planted out direct into their permanent positions, though we prefer to pot them up first and grow them on in a cold frame until they have rooted well. Basal cuttings in late spring. Harvest young shoots about 10 - 15c long and pot them up in a lightly shaded place in a greenhouse or cold frame. Plant them out into their permanent positions when well rooted. A very quick and easy method of propagation[K].

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a warm sunny dry position[1, 37, 52, 200]. Plants are not very long-lived when grown in clay soils[190]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Established plants are drought tolerant[190, 200]. Tolerates a pH in the range 6.5 to 7.8. Plants are relatively hardy in Britain, but can be killed in wet winters. It is best to grow tarragon in a dry, rather poor soil since this will produce harder plants[4]. The dry soil will also help to reduce predation by slugs, these creatures are very fond of the young growth and have been known to completely destroy even well-established plants[K]. When well suited, the plants can spread freely at the roots[K]. The flowers do not open in cool summers and viable seed is seldom produced[238]. Often grown in the herb garden, tarragon is also sometimes grown commercially for its edible leaves which are used mainly as a flavouring[46]. There is at least one named variety, 'Epicure' is a new fragrant cultivar[183]. There is a closely related species, *A. dracunculoides* or Russian tarragon, which is quite inferior in flavour, though some-

The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[2]. A strong onion flavour, it can be used in salads, as a cooked vegetable or as a flavouring in cooked foods[22, K]. The bulbs are rather small, usually 10 - 25mm in diameter though they can be up to 45mm[266], and are sometimes used as spring onions[183]. A nutritional analysis is available[218]. Leaves - raw or cooked[2]. They have a mild onion flavour[183] and can be added to salads or cooked as a vegetable[116]. The leaves are often available all through the winter if the weather is not too severe[K]. They contain about 1.4% protein, 0.3% fat, 4.6% carbohydrate, 0.8% ash, some vitamin B1 and moderate levels of vitamin C[179]. Flowers - raw. A pleasant onion flavour, but they are rather on the dry side[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Antibacterial Antifungal Antipyretic Diuretic Expectorant Stomachic Vitamin CThe bulb contains an essential oil that is rich in sulphur compounds[283]. It is antibacterial, antiseptic, diaphoretic, diuretic, galactagogue, stomachic, vermifuge and vulnerary[176, 218]. It is used in the treatment of colds and abdominal coldness and fullness[176]. A tea made from the roots is a children's sedative[218]. Use of the bulb in the diet impedes internal parasites[218]. Externally, the bulb can be made into a poultice to drain pus from sores, boils and abscesses[254].

propta Seed - sow spring in a greenhouse. The seed germinates over a wide range of temperatures, it is faster at higher temperatures[206]. Prick out the seedlings into individual pots when they are large enough to handle. When well-grown, the plants should be ready to be planted out in the summer. If they are not large enough at this time, grow them on in the greenhouse for their first winter and plant them out in late spring. Division of the plants is very easy and can be done at almost any time of the year though the spring is probably best. The divisions can be planted out straight into their permanent positions if required.

nwatta An easily grown plant[203], it prefers a sunny position in a light well-drained soil[1] but tolerates most soils[1, 52] including those that are damp and acid[203]. Prefers a pH in the range 6.5 to 7.5[206], but it tolerates a pH in the range 4.9 to 7.5. A very hardy species, it is related to the cultivated onion (*A. cepa*) and could be of value in breeding programmes. It is sometimes cultivated in the garden for its edible leaves which can be produced throughout the winter if the weather is not too severe[K]. A very popular cultivated vegetable in the Orient[206], it probably arose through cultivation from *A. altaicum*[203]. The oriental forms of this species, known as bunching onions, tend to be hardier and more robust than the Welsh onion[206]. There are two basic forms, multi-stem types and single-stem types. The single-stem types divide less freely than the multi-stems[206]. Plants will often retain their leaves even when covered in snow[206]. They are also tolerant of high temperatures and can be grown in the tropics[206]. The plants are often eaten by slugs[K]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

## 6.2.19 Allium schoenoprasum

Chives, Wild chives, Flowering Onion

5 tin 11 cyuc 5 kcaak 3 tcan 2 dwat 0.3 m hkuc

hmimhtut cyutli tcup hwicli hrasjutnykfrisp hpa7tli flatprkli-wisslip hpa7tmwatli fyfibre7t hjonli

drutta Allium schoenoprasum is a BULB growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from February to December, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Flowers Leaves RootEdible Uses: Leaves - raw, cooked or dried for later use. The leaves have a mild onion flavour and are an excellent addition to mixed salads, they can also be used as a flavouring in soups etc[2, 4, 5, 9, 27, 33]. The leaves are often available from late winter and can continue to produce leaves until early the following winter, especially if they are in a warm, sheltered position[K]. A good source of sulphur and iron[201]. A nutritional analysis is available[218]. The bulbs are rather small, and rarely exceed 10mm in diameter[200]. They can be harvested with the leaves still attached and be used as spring onions[K]. They have a pleasant mild onion flavour. The flowers can be used as a garnish in salads etc[183]. The flowers of this species are rather dry and less desirable than the flowers of many other species[K].

tcanta Fungicide RepellentLandscape Uses: Border, Container, Massing, Rock garden, Forest Garden. The juice of the plant is used as an insect repellent, it also has fungicidal properties and is effective against scab, mildew etc[14, 18, 20, 201]. The growing plant is said to repel insects and moles[14, 20, 200]. Dynamic accumulator. Ground cover,nectary, Ground Cover. Aromatic.

dwatta Appetizer Digestive Hypotensive TonicThe whole plant has a beneficial effect on the digestive system and the blood circulation. It improves the appetite, is digestive, hypotensive and tonic[201]. It has similar properties to garlic (*A. sativum*), but in a much milder form, and it is rarely used medicinally[238].

propta Seed - sow spring in a cold frame. Germination is usually free and easy, pot up the seedlings as soon as they are large enough to handle easily and plant out in the following spring. Division can be carried out at almost any time of the year but is probably best done in spring. The clumps should be divided at least every 3 or 4 years in order to maintain vigour[200], the divisions can be planted out direct into their permanent positions.

nwatta An easily grown plant[203], it prefers a sunny position in a rich moist but well-drained soil[14, 37], though it succeeds in most soils[1, 37, 200] and also in light shade[203]. Grows well in heavy clay soils[203]. Tolerates a pH in the range 5.2 to 8.3. Chives are commonly cultivated in the garden for their edible leaves which are available from late winter to the beginning of the following winter[K]. The bulbs divide rapidly and large clumps are quickly formed. There are some named varieties[183, 200, 203]. Chives are very tolerant of heavy harvesting, regular cutting of the leaves ensures a continuous supply of young leaves and prevents the plants flowering[33]. Plants can be moved into a frame or other protected environment in the autumn and will then produce leaves throughout the winter[33]. Do not do this every year or it weakens the plants. The bulbs should be planted fairly deeply[1]. A good bee plant[24]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. Helps to reduce the incidence of scab when it is grown under apple trees[201]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: North American native, Edible, Fragrant foliage, Invasive, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in

a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a bulb.

### 6.2.20 Carya illinoensis

Pecan

5 tlin 9 cyuc 4 kcaak 2 tcan 1 dwat 50 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli frusflatprikliwssilp hpa7tmwatli fyif hjonli

drutta Carya illinoensis is a deciduous Tree growing to 50 m (164ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from June to October, in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Milk Oil TeaSeed - raw or cooked[46, 82]. Sweet and delicious, they make an excellent dessert and are also often added to ice cream, used in cakes, bread etc[149, 183]. A milk can be made from the seed and is used to thicken soups, season corn cakes, hominy etc[183]. The seed is up to 4cm long and is produced in clusters of 3 -11[82, 229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. An edible oil is obtained from the seed[177, 183]. The leaves are said to be used as a tea[177, 183]. Carbon farming - Staple Crop: oil.

tcanta Fuel Oil Parasiticide WoodWood - coarse-grained, hard, heavy, brittle, not strong. It weighs 45 lb. per cubic foot. It is not as valuable a timber as other members of this genus and is used mainly for fuel and occasionally to make wagons and agricultural implements[46, 82, 227, 235]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Astrigent Parasiticide TBThe bark and leaves are astringent[227]. A decoction of the bark has been used to treat TB[257]. The pulverized leaves have been rubbed on the skin to treat ringworm[257].

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Global Crop Management: Standard Other Systems: Strip intercrop Staple Crop: OilLandscape Uses:Aggressive surface roots possible. Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Tolerates a pH in the range 4.5 to 8.3. Trees are fairly fast growing[200]. Trees do not grow very well in Britain, requiring hotter summers than are normally experienced here in order to fruit and fully ripen their wood[200]. However, a tree at Cambridge botanical gardens was 20 metres tall in 1985. Trees are said to be hardy to about -12°C, the same report also says that they are hardy to zone 5[200], which would experience considerably lower temperatures than this. Trees are probably much harder when grown in areas with

hot summers. In the wild, trees grow best in areas where summer temperatures average 24 - 30°C and the humidity is high[229]. Often cultivated for its edible seed, there are some named varieties[183]. Trees come into bearing when about 20 years old, the best period of production being between the ages of 75 to 225 years old[229]. Mature trees regularly give yields of 225 kilos, whilst yields of 450 kilos have been recorded[229]. A number of cultivars have been developed in N. America that succeed quite far north in that country[200]. These cultivars include:- ‘Carlson 3’. Early maturing, it is being trialled in Canada[183]. ‘Devore’. An early fruiting form with small nuts that have an excellent flavour[183]. ‘Gibson’. Precocious, protandrous, the nuts are of medium size with a good flavour[183]. ‘Green Island’. Amongst the hardiest of cultivars, it has been selected for nut size, flavour and productivity[183]. ‘Mullahy’. Hardy, precocious and very productive, it has ripened in Ontario[183]. Nuts are fairly large with an excellent flavour. ‘Voiles 2’. Usually ripens as far north as Ontario and New York[183]. The wind-blown pollen is a significant cause of hay fever in the United States[274]. This species is the State Tree of Texas[274]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Special Features:North American native, Inconspicuous flowers or blooms. Carbon Farming - Climate: cold temperate subtropical, tropical highlands. Humidity: humid. Cultivation: global crop. Management: standard. Other Systems: strip intercrop. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 6.2.21 Quercus frainetto

Hungarian Oak, Italian Oak, Forest Green Oak
5 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 30 m hkuc hminhmtu cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus frainetto is a deciduous Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked. The seed is up to 3.5cm long and 1.2cm wide[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. If the seed contains bitter tannins, these can be leached out

year[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils[1], including dry ones, preferring a rich moist soil[205]. Grows well in heavy clay soils. Succeeding in sun or shade, it produces more flowers in a sunny position though these flowers can be shorter-lived in very sunny positions[205]. Succeeds in short grass if the soil is moist[1]. Prefers a pH between 6 and 7[200]. Hybridizes freely with other members of this genus[200]. The roots have spindle-shaped swellings[205]. The cultivar ‘Major’ is smaller than the type species, but has larger flowers, it is sometimes cultivated for these edible flowers in Japan[205]. There is some doubt as to whether this cultivar really is a form of *H. aurantiaca*[205]. Individual flowers are very short-lived, opening in the morning and withering in the evening[205]. Plants take a year or two to become established after being moved[1]. Plants seem to be immune to the predations of rabbits[233]. The plants are very susceptible to slug and snail damage, the young growth in spring is especially at risk[200]. There is some doubt as to the origins of this plant, it might have arisen in cultivation at Kew[205]. It is cultivated in Japan, where it is believed to have come from China[58]. It is quite possibly a hybrid since it is sterile unless fertilized by another species[233].

### 6.2.67 Campanula fenestrellata

Adriatic Bellflower

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.2 m hkuc hminhmtu cyutli tcup hwicli hrasjlut hpa7tli prikliwis hpa7tmwatli fyfxre7t hjonli

drutta Campanula fenestrellata is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[K]. A pleasant sweet flavour[K]. It makes a very acceptable addition to mixed salads in the winter[K]. Flowers - raw. Produced in abundance, they have a pleasant sweet flavour and make a decorative addition to the salad bowl[K].

tcanta None known

dwatta None known

propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°c[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring[1]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn[200]. Very easy, the plant can be divided at almost any time of the year[221].

nwatta Prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in full sun though it also tolerates partial shade[1, 200, 208]. Plants are very drought-tolerant and can be grown on a dry stone wall[200], they also succeed in poor soils[221]. Plants are hardy to at least -15°c[200]. Closely related to *C. garganica*, differing in its larger leaves, longer stems and fewer flowers. The pollen is blue, whilst that of *C. garganica* is yellow[271]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.68 Peltaria turkmena

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.5 m hkuc hminhmtu cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Peltaria turkmena is an evergreen Perennial growing to 0.5 m (1ft 8in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[K]. A strong flavour, somewhat like a cross between garlic and mustard, the leaves make a reasonable flavouring for salads[K]. The leaves are available for most of the year, even in a severe winter they remain green and lush[K]. At this time they add an especially welcome spiciness to salads[K]. They can become rather bitter in the summer, though, especially if the plants are in a dry sunny position[K]. When flowering in early summer, the plants lose their leaves for a month or two - cutting down the flowering stems at this time will induce new fresh green growth[K]. Flowers - raw. A similar flavour to the leaves, with very little bitterness, they make a very tasty addition to summer salads[K].

tcanta The plants can be used as a ground cover, somewhat slow spreading but they are effective in excluding weeds[K].

dwatta None known
propta Seed - sow spring or autumn in a cold frame[200].

The seed germinates rapidly, prick the seedlings out into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer[K]. Division in spring or autumn. Very easy, it can be done at almost any time of the year so long as the soil is kept moist. Divisions in the winter should be potted up in a greenhouse to allow themselves to establish, they can then be planted out in late spring.

nwatta Prefers a light fertile moist soil in sun or light shade[200], though it is not too fussy[K]. A very easily grown plant that tolerates considerable neglect[K].

### 6.2.69 Houttuynia cordata

Tsi, Chameleon, Rainbow Plant, Chameleon Plant

5 tlin 10 cyuc 4 kcaak 2 tcan 3 dwat 0.6 m hkuc pmchimm cyutli tcuphja7hns6s hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Houttuynia cordata is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Fruit Leaves Root ShootsEdible Uses: Teder young shoots and leaves - raw or cooked as a pot-herb[2, 61, 103, 183, 272]. The leaves and young shoots are harvested in the spring when about 8cm long[264]. Strongly aromatic according to one report[183] whilst others say that it is rather smelly and somewhat like rotten fish[105, 178]. Our experience is that the leaves have a delicious orange-like smell and make a marvellous flavouring in salads[K]. One report says that there are two distinct chemotypes of this species. Plants from Japan have an orange scent, whilst those from China have a smell resembling coriander leaves (*Coriandrum sativum*)[238]. Some people seem to really like this leaf, others are indifferent to it or strongly dislike it[K]. It also varies quite considerably according to the time of year. In the spring and summer it has a very acceptable flavour, but by autumn a distinct bitterness has crept in[K]. Root - cooked[177, 183]. Same comments on the smell as for the leaves[105]. Fruit[183]. No further details[K], but the fruit is a capsule that contains many small seeds[200].

tcanta A good ground cover plant[200]. Plants do not form a weed-suppressing cover[K]. A spreading plant, it



dwatta Anthelmintic Antiasthmatic Anticholesterolemic Antiseptic Antispasmodic Cholagogue Diaphoretic Diuretic Expectorant Febrifuge Stimulant Stings Stomachic Tonic Vasodilator This species has the same medicinal virtues as garlic, but in a much milder and less effective form[238]. These virtues are as follows: Garlic has a very long folk history of use in a wide range of ailments, particularly ailments such as ringworm, Candida and vaginitis where its fungicidal, antiseptic, tonic and parasitocidal properties have proved of benefit[218]. It is also said to have anticancer activity[218]. Daily use of garlic in the diet has been shown to have a very beneficial effect on the body, especially the blood system and the heart. For example, demographic studies suggest that garlic is responsible for the low incidence of arteriosclerosis in areas of Italy and Spain where consumption of the bulb is heavy[222]. The bulb is said to be anthelmintic, antiasthmatic, anticholesterolemic, antiseptic, antispasmodic, cholagogue, diaphoretic, diuretic, expectorant, febrifuge, stimulant, stomachic, tonic, vasodilator[4, 9, 14, 21, 46, 165]. The crushed bulb may be applied as a poultice to ease the pain of bites, stings etc[4, 9, 14, 21].

propta Seed - for an early crop, or for larger plants, sow the seed in early spring in a greenhouse and plant out in May. For smaller or later plants, sow April in an outdoor seedbed and plant out as space permits in July or even August.

nwatta Prefers a sunny position in a light well-drained soil[1] but succeeds in most soils[16]. Grows well in heavy clay soils. Prefers an open situation[1, 37]. Does best in a soil that was well fed for a previous crop[1]. Tolerates a pH in the range 5.2 to 8.3. The leek is a widely cultivated vegetable, there are many named varieties[183]. Young plants are often planted quite deeply in the soil (8 - 10cm deep) in order to blanch the lower stem, it is also a common practice to earth up the growing plants in order to blanch right the way up the stems. Whilst this does make the stems more tender, it also results in a loss of minerals and vitamins. Although commonly treated as a biennial, this plant is a true perennial, perennating by means of small lateral growths and often developing a roundish bulb at the base of the main growth[1]. A relatively slow-growing plant, it can be interplanted with faster maturing species such as lettuces[201]. The bulbs should be planted fairly deeply[1]. Grows well with most plants, especially roses, carrots, celery, celariac, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.65 Allium tricoccum

Wood Leek, Ramp

5 tlin 9 cyuc 4 kcaak 3 tcan 2 dwat 0.3 m hkuc hmim htut cytli tcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Allium tricoccum is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from March to June, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kckaata Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[46, 61, 159]. An early Spring vegetable. Used mainly as a flavouring in salads and savoury dishes[238]. This is one of the best N. American wild species for sweetness and flavour[95]. A mild sweet flavour, resembling leeks[183]. The bulb is rather small, it is up to 12mm wide and 50mm tall[235] and is produced in clusters on a rhizome[200]. Leaves - raw or cooked[62]. The unfolding leaves in spring have a mild sweet flavour, resembling leeks[183]. Flowers - raw. Used as a garnish on salads. A hot onion flavour[K].

tcanta Companion RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20]. A good shade plant. Tolerates Juglone (a substance produced by a plant to stunt the growth of another plant).

dwatta EmeticThis species probably has most of the medicinal virtues of garlic (*Allium sativum*) but in a milder form[222, 238]. Traditionally the leaves were used in the treatment of colds and croup, and also as a spring tonic[222, 238]. The warm juice of the leaves and bulb was used externally in the treatment of earaches[222, 238]. A strong decoction of the root is emetic[222].

propta Seed - sow spring in a cold frame. The seed usually germinates within 12 months, but only makes a root and a small bulb in its first year of growth. Top growth is not produced until the second spring[K]. It is quite possible that if the seed can be sown when it is ripe in early summer, or in the autumn, then this will speed up germination times[K]. Sow the seed thinly in the pots so that the young seedlings can be allowed to grow on undisturbed for their first two years. Apply a liquid feed once a month during the growing season to ensure they do not suffer from mineral deficiency. When the plants are dormant at the end of their second years growth, divide them so that there are 2 - 3 small bulbs in each pot. Grow them on for a further year in the greenhouse and then plant them out when they are dormant. Division in spring. Very easy, the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. Grows well in light moist woodland, where the plant forms large clumps and can become invasive[203, 235]. It is probably best grown in the wild garden[203]. Plants are hardy to at least -15°C[238]. The bulbs should be planted fairly deeply[1]. The leaves die down in early summer before the flowers have fully opened. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is a bulb.

## 6.2.66 Hemerocallis aurantiaca

5 tlin 9 cyuc 4 kcaak 2 tcan 1 dwat 0.8 m hkuc hmimhtut cytli kyucptuc hwicli hrasjlutnykifrip hpa7tli flatprklwis hpa7tmwatli dyatxre7t hjonli

drutta Hemerocallis aurantiaca is an evergreen Perennial growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from June to September. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckaata Edible Parts: Flowers Leaves RootEdible Uses: Leaves and young shoots - cooked[105, 177]. They must be consumed when very young or else they become fibrous[K]. Flowers and flower buds - raw or cooked. The tubular flowers are about 7.5cm long and 13cm in diameter[205]. Each stem carries 6 - 8 flowers[205]. The flowers contain carotene and starch[105, 177]. The flower buds contain about 43mg vitamin C per 100g, 983 IU vitamin A and 3.1% protein[205]. Root - raw or cooked. A radish-like flavour but not so sharp[205].

tcanta WeavingThe tough dried foliage is plaited into cord and used for making footwear[205].

dwatta Antidote Diuretic Vitamin CThe juicy of the roots is an effective antidote in cases of arsenic poisoning[205]. A tea made from the boiled roots is used as a diuretic[205].

propta Seed - sow in the middle of spring in a greenhouse. Germination is usually fairly rapid and good. Prick out the seedlings into individual pots when they are large enough to handle. Grow the plants on for their first winter in a greenhouse and plant out in late spring[K]. Seed is only set if the plant is fertilized by another species, thus seedlings will not be true to the species type[233]. Division in spring or after flowering in late summer or autumn[200]. Division is very quick and easy, succeeding at almost any time of the

by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Buttons Repellent TanninA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. The seed cups are used as buttons[95]. The bark is a commercial source of tannin[46, 223]. Tannin is also found in the leaves and wood[223]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Seashore. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. This species thrives in Britain, despite our cooler summers, but it only bears acorns occasionally[11]. The acorns ripen in their first year[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 6.2.22 Vitis rotundifolia

Muscadine Grape, Muscadine, Southern Fox Grape, Scuppernong, Muscadine Grape

5 tlin 9 cyuc 4 kcaak 1 tcan 0 dwat 25 m hkuc hmimhtut cytli kyucptuc hwicli hrasjlutnyk hpa7tli flatprklwis hpa7tmwatli fyfxre7t hjonli

drutta Vitis rotundifolia is a deciduous Climber growing to 25 m (82ft 0in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckaata Edible Parts: Fruit Leaves ShootsEdible Uses: Fruit - raw or dried for winter use[1, 2, 22, 46]. Thick-skinned[61] with a pleasant musky flavour[11, 200, 219]. Pleasant to eat raw, the fruit is excellent in jellies, pies etc[183]. The fruit is up to 25mm in diameter[200] and is produced in small bunches[235]. Leaves - cooked[55]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked[55, 85].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as

soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Landscape Uses:Arbor. Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Prefers a position in full sun[160] Plants climb by means of tendrils[182]. They grow particularly well up elm trees[18]. Cultivated for its edible fruit in N. America[46, 61], there are some named varieties[183]. Most plants are self-fertile[160], but there are some cultivars that only produce female flowers and require pollination[183]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Resistant to Phylloxera disease, a disease that almost destroyed the European grape crops. This species can be used as a rootstock in areas where the disease is prevalent and can also be used in breeding programmes with *V. vinifera* in order to impart resistance to that species[160]. Plants are , however, susceptible to infestation by aphids[160]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, Inconspicuous flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 6.2.23 Sorbus torminalis

Wild Service Tree, Checkertree

5 tlin 9 cyuc 4 kcaak 2 tcan 0 dwat 20 m hkuc hmimhtut cytli tcup hwicli hrasjlutnykifrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Sorbus torminalis is a deciduous Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kckaata Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 5, 11, 74, 115, 183]. The taste is best after a frost because it turns sweeter. The fruit can also be bleeted if it is going to be eaten raw[3, 183]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit. Rich in vitamin C. The fruit is up to 1.5cm across[200] and is borne in bunches which makes it easier to harvest[K].

tcanta WoodWood - heavy, fine grained, polishes well. Used for turning, wood carving[74, 115].

dwatta Antirheumatic Hypoglycaemic Vitamin CNone known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold

frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils so long as they are not too poor or acid, in an open sunny position[1, 11]. Prefers clay soils[3, 11]. Tolerates moderate shade[188], but does not fruit so well in such a position[K]. Grows best in the eastern half of Britain[121]. Plants are susceptible to firelight[188]. Plants respond well to coppicing[186]. When found in a truly wild situation this species is considered to be an indication of primary woodland[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.24 Pinus edulis

Rocky Mountain Piñon, Twoneedle pinyon, Nut Pine, Pinyon Pine, Rocky Mountain Pinyon Pine, Singlelea  
5 tin 8 cyuc 4 kcaak 3 tcan 2 dwat 15 m hkuc  
htut cyutli hqatkyuctcup hwicli hyishrasljut hpa7tli frusflatprik hpa7tmwatli dyat hjonli

drutta Pinus edulis is an evergreen Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Inner bark Seed SeedpodEdible Uses: Condiment Gum TeaSeed - raw or cooked[82, 177]. A slightly resinous flavour, but delicious raw or cooked[2, K]. The seed can be ground into a meal and used in stews, making bread, cakes etc and in making nut butter[183]. The seed is up to 25mm long[160]. Rich in oil, protein[183] and thiamine[160]. The seed contains about 15% protein[213]. An important item of food for the local Indians, it is also sold in local markets of Colorado and New Mexico[61, 82]. About 450,000 kilos of the seeds are sold in American markets each year[229]. The leaves can be brewed into a tea[183, 257]. Immature female cones - roasted. The soft centre forms a sweet syrupy food[183]. Inner bark - cooked. A sweet flavour, it is cut into strips and cooked like spaghetti[183]. Inner bark can also be dried, ground into a powder and used as a thickening in soups or can be mixed with cereal flours when making bread etc[257]. The pitch from the trunk can be hardened and used as a chewing gum[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Adhesive Dye Fuel Gum Herbicide Ink Paint Resin WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. This species yields a resin, but it is not commercially important. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The gum (this almost certainly means the resin[K]) is used in waterproofing baskets, canoes etc, for repairing pottery vessels and in making turquoise mosaic[216, 257]. It has also been used as a red paint on jars and bowls[257]. For waterproofing containers, the gum was melted and poured inside the container. The container was then turned round to ensure the gum came

into contact with all parts of the inside. More gum would then be applied to the outside[257]. The resin has been used as a glue for fixing turquoise in jewellery[257]. The gum has been used, with sumac leaves (*Rhus* spp) and yellow ochre to make a black dye and ink[257]. The sumac leaves are boiled until there is a strong mixture. Whilst the sumac was boiling, the ochre was powdered and roasted. The gum was then added to the ochre and the whole roasted again. As the roasting proceeded, the gum melted and finally the mixture was reduced to a black powder. This was then cooled and thrown into the sumac mixture, forming a rich blue-black fluid that was essentially an ink[257]. Wood - light, soft, not strong, brittle. Used for fuel, fencing etc[61, 82]. A charcoal made from the wood is used in smelting[82]. The wood makes a good fuel, burning with few sparks being thrown out[257].

dwatta Antiseptic Depurative Diuretic Emetic Expecto-rant Pectoral Plaster Rubefacient VD VermifugeThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy in the treatment of kidney, bladder and rheumatic affections, and also in diseases of the mucous membranes and the treatment of respiratory complaints[4]. Externally it is used in the form of liniment plasters and poultices on cuts, boils, burns and various skin problems[4, 257]. The heated pitch has been applied to the face to remove facial hair[257]. The gum is used as a plaster on cuts and sores[216]. An infusion of the leaves has been used as an emetic to cleanse the stomach[257]. The leaves have been chewed in the treatment of venereal diseases[257]. The leaves have been burnt and the smoke inhaled as a treatment for colds[257]. The inner bark is expectorant[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Management: Standard Staple Crop: Protein-oil Wild Staple CropLandscape Uses:Border, Erosion control, Massing, Screen, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Succeeds in a hot dry position[200]. Prefers an acid soil in full sun[160]. A very hardy species, tolerating temperatures down to about -35°C when it is fully dormant[160]. A slow-growing but long-lived tree in the wild[185, 229], it takes about 25 years from seed before it produces seed[117]. It then produces good crops every 3 - 4 years[229]. The cones open and shed their seed whilst still attached to the tree[226]. Trees take about 250 - 350 years to reach full maturity[181]. This species is considered by some botanists to be no more than a form of *P. cembroides*, its main difference from that species is that it has leaves in bundles of two whereas *P. cembroides* usually has bundles of three[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological dam-

complaints etc[238]. The oil can cause allergic reactions and irritation to the skin and mucous membranes[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can keep for three years in normal storage[4]. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden. Prefers a light, dry calcareous soil and a sunny position[4, 7, 11, 27, 37]. Succeeds in dry soils, poor soils and tolerates drought once it is established[190]. Plants can be grown on old walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Thyme is hardy to about -15°C[200], though it is even hardier when grown on old walls are in well-drained poor light soils[4]. Thyme is commonly grown in the herb garden, there are many named varieties[182]. It is also harvested commercially for its essential oil[218]. The leaves are very aromatic[190]. It is sometimes grown as an annual from seed when used for culinary purposes[200]. The flowers are rich in nectar and are very attractive to honey bees[4, 7, 200]. Thyme is a good companion for most plants[20, 54], it is said to repel cabbage root flies when grown near brassicas[18, 20]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone, 11-1 indicates that the plant is heat tolerant in zones 11 through 1. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 6.2.63 Gaultheria hispidula

Creeping Snowberry  
5 tin 9 cyuc 4 kcaak 4 tcan 1 dwat 0.1 m hkuc  
hmim cyutli tucphja7n hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Gaultheria hispidula is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked. Pleasantly acid and refreshing[3, 101], with a delicate flavour of wintergreen[183]. An agreeable sub-acid taste, similar to *G. shallon*[2, 11]. They can be made into delicious preserves[183]. The fruit is about 6mm in diameter[200]. Leaves - raw or cooked[207]. The leaves are used to make a tea[2, 95, 161, 257]. A mild flavour of wintergreen[183]. Said to be superior to china tea[207].

tcanta MiscellanyA useful fast growing ground cover plant for shady positions.

dwatta Cancer Cytostatic MiscellanyThe plant is said to remove the cancerous taint from the body[4]. An infusion of the leaves has been used as a tonic for a person who has overeaten[257].

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Layering.

nwatta Prefers a moist but not boggy humus rich soil in shade or semi-shade[11]. A peat and moisture loving species, it requires a lime-free soil[11]. The fruit is sometimes sold in local markets[61]. A fast growing plant[200]. The plant can make a good nesting place for mice, these mice then eat the bark of the stems in winter causing die-back. Plants in this genus are notably resistant to honey fungus[200]. *Gaultheria japonica* bears a close resemblance to *G. hispidula* (L.) Bigelow of N. America and sometimes treated as a variety or subspecies of the latter. *G. japonica*, however, has calyx much longer than the bracteoles, ovate and acute calyx lobes, and shorter anther projections. In *G. hispidula* the calyx is as long as or slightly longer than the bracteoles, the calyx lobes are broadly ovate and obtuse or subacute, and the anthers have distinct projections. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 6.2.64 Allium porrum

Leek, Garden leek  
5 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.9 m hkuc  
htut cyutli tcup hwicli hrasljutnyikfripr hpa7tli flatprikwslip hpa7tmwatli xre7t hjonli

drutta Allium porrum is a BULB growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: The leaves and long white blanched stem are eaten cooked[2, 16, 37, 183]. They can also be cut into thin slices and be added to salads[183]. A mild onion flavour with a delightful sweetness[183, K]. Bulb - raw or cooked. The bulb is produced in the plants second year of growth (that is, after it is normally harvested). The bulb is somewhat larger if the plant is prevented from flowering[K]. Flowers - raw. Used as a garnish on salads, though they are rather on the dry side and less pleasant than many other members of the genus[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Aperient Cholagogue Depurative Diuretic Eczema Hepatic Hypoglycaemic Laxative Miscellany Stomachic Tonic Urinary Vitamin C WartsThe dandelion is a commonly used herbal remedy. It is especially effective and valuable as a diuretic because it contains high levels of potassium salts and therefore can replace the potassium that is lost from the body when diuretics are used[238]. All parts of the plant, but especially the root, are slightly aperient, cholagogue, depurative, strongly diuretic, hepatic, laxative, stomachic and tonic[4, 7, 9, 21, 54, 165, 176, 222, 238]. The root is also experimentally cholagogue, hypoglycaemic and a weak antibiotic against yeast infections[222]. The dried root has a weaker action[222]. The roots can be used fresh or dried and should be harvested in the autumn when 2 years old[4]. The leaves are harvested in the spring when the plant is in flower and can be dried for later use[9]. A tea can be made from the leaves or, more commonly, from the roots[213]. The plant is used internally in the treatment of gall bladder and urinary disorders, gallstones, jaundice, cirrhosis, dyspepsia with constipation, oedema associated with high blood pressure and heart weakness, chronic joint and skin complaints, gout, eczema and acne[238]. The plant has an antibacterial action, inhibiting the growth of *Staphylococcus aureus*, *Pneumococci*, *Meningococci*, *Bacillus dysenteriae*, *B. typhi*, *C. diphtheriae*, *Proteus* etc[176]. The latex contained in the plant sap can be used to remove corns, warts and verrucae[7]. The latex has a specific action on inflammations of the gall bladder and is also believed to remove stones in the liver[7]. A tea made from the leaves is laxative[222]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Taraxacum officinale* for dyspepsia, urinary tract infections, liver and gallbladder complaints, appetite loss (see [302] for critics of commission E).

propta Seed - sow spring in a cold frame and either surface-sow or only just cover the seed. Make sure the compost does not dry out. Germination should take place within 2 weeks, though 2 weeks cold stratification may improve germination. Prick out the seedlings into individual pots when they are large enough to handle, choosing relatively deep pots to accommodate the tap root. Plant them out in early summer. Division in early spring as the plant comes into growth.

nwatta A very easily grown plant, it succeeds in most soils[1], though it prefers a well-drained humus-rich neutral to alkaline soil in full sun or light shade[37, 238]. A very hardy plant, tolerating temperatures down to at least -29°C[238]. The dandelion is a common weed of lawns and grassy places. Though it has a bitter flavour, the plant is often cultivated as a salad crop and as a medicinal plant, especially in parts of Europe. There are some named varieties with larger, more tender and less bitter leaves[183]. Dandelions can provide edible leaves all year round, especially if they are given a small amount of protection in the winter[K]. A valuable bee plant and an important food plant for the caterpillars of many butterfly and moth species[4, 24, 30, 54], it grows well in a spring meadow[24]. A deep rooting plant, it has roots up to 1 metre long and brings up nutrients from lower levels of the soil[201]. An excellent plant to grow in lawns, if the lawn is cut no more than fortnightly then the dandelions will provide a good quantity of edible leaves[K]. Grows well with alfalfa[18, 201]. Another report says that it inhibits the growth of nearby plants[54]. This is probably a reference to the fact that the plant gives off ethylene gas, this gas is a hormone that promotes the premature ripening of fruits and also induces the premature fruiting of plants, thereby stunting their growth[14, 18]. *T. officinale* is not a valid name for this species, but no valid name has as yet been ascribed to it[200]. This is actually an aggregate species of many hundreds of slightly differing species. Most seed production is apomictic which means that plants produce seed non-sexually and all seedlings are clones of the parent, thus small differences are maintained. Special Features:Edible, Not North American native, Invasive, Naturalizing, Suitable for dried flowers, Extended bloom season in Zones 9A and above. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin

to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 6.2.62 Thymus vulgaris

Common Thyme, Garden thyme, Wild Thyme  
5 tlin 11 cyuc 4 kcaak 5 tcan 3 dwat 0.2 m hkuc  
htut cyutli kyuctup hwicli hyishrasljut hpa7tli prikwiw  
hpa7tmwatli xre7t hjonli

drutta *Thymus vulgaris* is an evergreen Shrub growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves ShootsEdible Uses: Condiment TeaLeaves and flowering tops - raw in salads, used as a garnish or added as a flavouring to cooked foods, going especially well with mushrooms and courgettes[2, 4, 21, 46, 183, 238]. It is an essential ingredient of the herb mix 'bouquet garni'[238]. It retains its flavour well in long slow cooking[200]. The leaves can be used either fresh or dried[183]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200]. A nutritional analysis is available[218]. An aromatic tea is made from the fresh or dried leaves[21, 183]. Pungent and spicy[183].

tcanta Deodorant Disinfectant Essential Fungicide Potpourri RepellentAn essential oil from the leaves is frequently used in perfumery, soaps, toothpastes, mouthwashes, medicinally etc[11, 21, 57, 89, 238]. It has fungicidal properties[171] and is also used to prevent mildew[218]. The leaves are dried and used in pot-pourri[238]. The plant makes an attractive ground cover for a sunny position[201]. Plants are best spaced about 30cm apart each way[208]. The dried flowers are used to repel moths from clothing[4] whilst the growing plant is said to repel cabbage root fly[18, 20].

dwatta Anthelmintic Antiseptic Antispasmodic Aromatherapy Carminative Deodorant Diaphoretic Disinfectant Expectorant Sedative TonicCommon thyme has a very long history of folk use for a wide range of ailments[218]. It is very rich in essential oils and these are the active ingredients responsible for most of the medicinal properties[218]. In particular, thyme is valued for its antiseptic and antioxidant properties, it is an excellent tonic and is used in treating respiratory diseases and a variety of other ailments[254]. The flowering tops are anthelmintic, strongly antiseptic, antispasmodic, carminative, deodorant, diaphoretic, disinfectant, expectorant, sedative and tonic[4, 7, 21, 200, 218]. The plant is used internally in the treatment of dry coughs, whooping cough, bronchitis, bronchial catarrh, asthma, laryngitis, indigestion, gastritis and diarrhoea and enuresis in children[238]. It should not be prescribed for pregnant women[238]. Externally, it is used in the treatment of tonsillitis, gum diseases, rheumatism, arthritis and fungal infections[238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238]. Thyme has an antioxidant effect, thus regular use of this herb improves the health and longevity of individual body cells and therefore prolongs the life of the body[254, K]. The essential oil is strongly antiseptic[4]. The whole herb is used in the treatment of digestive disorders, sore throats, fevers etc[4]. The essential oil is one of the most important oils used in aromatherapy[7, 210]. Its keyword is 'Bacterial'[210]. It is used especially in cases of exhaustion, depression, upper respiratory tract infections, skin and scalp

age. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 6.2.25 Pinus quadrifolia

Parry Piñon, Parry's Pinyon Pine, Four-leaved Pinyon  
5 tlin 8 cyuc 4 kcaak 0 tcan 2 dwat 15 m hkuc  
htut cyutli hgatyuctup hwicli hyishrasljut hpa7tli flatprik  
hpa7tmwatli dyat hjonli

drutta *Pinus quadrifolia* is an evergreen Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: CondimentSeed - raw or cooked[1, 81, 161]. An important food crop for the Indians of Baja California[82, 183], the oil-rich seed has a mild resinous flavour and a pleasant soft texture. A good size, up to 16mm long[200]. The seed contains about 11% protein, 37% fat, 44% carbohydrate[183]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Adhesive Basketry Cosmetic Dye Fuel Herbicide Roofing WoodA tan or green dye is obtained from the needles[168]. The roots have been used to make baskets[257]. The bark has been used as a roofing material in houses[257]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The pitch has been used as a face cream to prevent sunburn[257]. The pitch can be used as an adhesive on pottery etc[257]. Wood - light, soft, close grained[82]. It burns well and gives off a pleasant odour[257].

dwatta Antiseptic Diuretic Pectoral Poultice Rubefacient Vermifuge VulneraryThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K].

Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the shoot short. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Landscape Uses:Screen, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought, succeeding in a hot dry position[200]. This species is closely related to *P. cembroides* and considered to be no more than a sub-species of it by some botanists[11]. The main difference is that this species has its leaves in bundles of four whilst *P. cembroides* has them in bundles of two or three[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. It extensively hybridizes with *P. californiarum* in most of its range[200]. The cones open and shed their seed whilst still attached to the tree[226]. A slow growing tree, taking 25 years from sowing until it produces a crop of seeds[117]. The tree is long-lived, taking 250 - 350 years to reach maturity[181]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, Inconspicuous flowers or blooms.

## 6.2.26 Acer saccharum grandidentatum

Big-Tooth Maple, Canyon Maple, Rocky Mountain Sugar Maple  
5 tlin 8 cyuc 4 kcaak 0 tcan 0 dwat 12 m hkuc  
hmimhtut cyutli toup hwicli hrsajlutnykfrrip hpa7tli flatprik  
wis hpa7tmwatli hjonli

drutta *Acer saccharum grandidentatum* is a deciduous Tree growing to 12 m (39ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from April to May, and the seeds ripen in September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Inner bark Sap SeedEdible Uses: SweetenerThe sap is relatively rich in sugar and can be made into a drink or concentrated into a syrup by boiling off the water[1, 2, 11, 34, 57]. The syrup is used as a sweetener on many foods. It can be harvested in late winter or early spring[[142], the flow is best on a warm sunny day after a frost. Trees on southern slopes in sandy soils give the best yields. It is best to make a hole about 7cm deep and about 1.3 metres above the ground[171]. Yields of 40 - 100 litres per tree can be obtained[142]. The best sap production comes from cold-winter areas with continental climates. Seed - boiled then roasted[62, 105, 159]. The seed is about 6mm long and is produced in small clusters[82]. Inner bark cooked. It is dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 161].

tcanta Fuel Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - close grained, tough, hard, heavy. Used for furniture, ship building, etc[46, 61, 82, 171]. It is a good fuel.

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. A lot of the seed is non-viable, it is best to cut a few open to see if there is an embryo[113]. An average of 95% germination can be achieved from viable seed[98]. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate, sometimes taking two years[125]. The seed can be harvested 'green' (when it has fully devel-

oped but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen, Street tree. Of easy cultivation, it prefers a good moist well-drained soil but succeeds on most soils[11, 98]. Chlorosis can often develop as a result of iron deficiency when the plants are grown in alkaline soils. Grows well in heavy clay soils. Trees need full light and a lot of space if they are to grow well[98]. Plants are hardy to about -45°C when fully dormant[160]. This species is not a great success in Britain[1], though it does better than once thought[11]. It grows well in Cornwall[59]. Slow growing when young[11]. Plants produce prodigious root growth but very little top growth in first year from seed[133]. A very ornamental tree[1] but a bad companion plant, inhibiting the growth of nearby plants[18, 20]. This species is commercially exploited in America for its sap[1, 11]. Along with *A. saccharum* and the sub-species *A. s. nigrum* it is the major source of maple syrup[11]. There are some named varieties[183]. The sap can be tapped within 10 - 15 years from seed but it does not flow so well in areas with mild winters[160]. Special Features:North American native, Inconspicuous flowers or blooms.

### 6.2.27 Cornus officinalis

Shan Zhu Yu, Asiatic dogwood, Japanese Cornel Dogwood
5 tin 8 cyuc 4 kcaak 0 tcan 3 dwat 10 m hkuc
hmmihtut cyutli hcattcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwissip hpa7tmwatli xre7t hjonli

drutta Cornus officinalis is a deciduous Shrub growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from February to March, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fully ripe fruit is quite pleasant but slightly astringent[K]. It is about 1.5cm long[200]. The fruit contains about 8.6% sugars, 2.9% malic acid, 0.74% ash[179].

tcanta None known

dwatta Antibacterial Antifungal Antiperiodic Antiseptic Antitumor Astringent Diuretic Hepatic Hypotensive Malaria Tonic UrinaryShan Zhu Yu has been used for at least 2,000 years in Chinese herbal medicine. It is a herb that “stabilizes and binds” and is used principally to reduce heavy menstrual bleeding and unusually active secretions including copious sweating, excessive urine, spermatorrhoea and premature ejaculation[147, 238, 254]. Like all herbs that suppress bodily fluids (even excessive ones), it will simply prolong or lead to a worsening of symptoms if it is used without tonic or detoxifying herbs[254]. It is, therefore, normally used in combination with herbs such as *Rehmannia glutinosa* and is an ingredient of the “Pill of eight ingredients” which is used in China to “warm up and invigorate the yang of the loins”[254]. The fruit is antibacterial, antifungal, hypotensive, antitumor, astringent, diuretic, hepatic and tonic[116, 147, 176, 178, 238]. The fruit, without the seed, is decocted for the treatment of arthritis, fever and a wide range of other ailments[218, 279]. It is used in the treatment of senile lumbago, diabetes, cystitis, tinnitus etc[174, 254, 279]. The fruit has an antibacterial action, inhibiting the growth of *Bacillus*

dysenteriae and *Staphylococcus*[176]. The fruit is harvested when fully ripe and is dried for later use[238]. The stem bark is astringent, antimalarial and tonic[218]. The plant is antibacterial, diuretic, hypotensive and a urinary antiseptic[218].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year’s growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Border, Massing, Standard, Specimen, Street tree. An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188]. A very ornamental plant[11], it is very closely related to *C. mas*[1, 11] but is more tree-like in its habit[K]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attractive flowers or blooms.

### 6.2.28 Pyrus pyrifolia

Sand Pear, Chinese pear
5 tin 9 cyuc 4 kcaak 0 tcan 1 dwat 10 m hkuc
hmmihtut cyutli hgattcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Pyrus pyrifolia is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in April, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Hard and gritty[11]. Firm crisp and juicy when fully ripe, they are eaten out of hand or used in fruit salads, pies or baked etc[183]. The fruit is up to 3cm long[200]. Up to 5cm in another report[194]. The average yield from wild trees in the Himalayas is 83kg per year, though some trees yield up to 200kg[194]. The fruit contains about 4.9% sugars, 3.2% protein, 0.9% pectin[194].

tcanta None known

dwatta Antiseptic Astringent Febrifuge Nervine PectoralAntiseptic, astringent, febrifuge, nervine, pectoral[178].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. A parent of the cultivated Asian pears[11]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and

kcakta Edible Parts: Root. SeedEdible Uses: Root - raw or cooked[257. It is usually peeled before being eaten[257]. The root can be dried and ground into a powder and then be mixed with cereal flours or added as a flavouring to soups etc[46, 61, 95, 105]. When dug up in the spring it has a parsnip-like flavour[161]. Seed[106]. No more details are given, though it is most likely used as an aromatic flavouring in cooked foods[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed can be rather slow to germinate, when sown in the spring it usually takes at least 12 months to germinate. Giving it a period of cold stratification might reduce this time. The seedlings need to be pricked out into individual pots as soon as they are large enough to handle, and should be planted out into their permanent positions in the summer. Fresh seed can be sown immediately in situ. Division may be possible in spring or autumn.

nwatta We have almost no information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in much of the country. It can be assumed that plants will require a dry to moist but well-drained soil in a sunny position. Polymorphic[60]. This is a taxonomically very difficult genus, many of the species now included in it have at times been included in other genera[60]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

### 6.2.60 Gaultheria japonica

Creeping Snowberry
5 tin 9 cyuc 4 kcaak 3 tcan 1 dwat 0.1 m hkuc
hmmi cyutli tcuphja7n hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Gaultheria japonica is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by In-sects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: Fruit. LeavesEdible Uses: TeaFruit - raw or cooked. Pleasantly acid and refreshing[3, 101], with a delicate flavour of wintergreen[183]. An agreeable sub-acid taste, similar to *G. shallon*[2, 11]. They can be made into delicious preserves[183]. The fruit is about 6mm in diameter[200]. Leaves - raw or cooked[207]. The leaves are used to make a tea[2, 95, 161, 257]. A mild flavour of wintergreen[183]. Said to be superior to china tea[207].

tcanta A useful fast growing ground cover plant for shady positions.

dwatta CancerThe plant is said to remove the cancerous taint from the body[4]. An infusion of the leaves has been used as a tonic for a person who has overeaten[257].

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins[200]. Larger clumps can be replanted direct into their permanent

positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Layering.

nwatta Prefers a moist but not boggy humus rich soil in shade or semi-shade[11]. A peat and moisture loving species, it requires a lime-free soil[11]. A fast growing plant[200]. The plant can make a good nesting place for mice, these mice then eat the bark of the stems in winter causing die-back. Plants in this genus are notably resistant to honey fungus[200]. *Gaultheria japonica* bears a close resemblance to *G. hispiduala* (L.) Bigelow of N. America and sometimes treated as a variety or subspecies of the latter. *G. japonica*, however, has calyx much longer than the bracteoles, ovate and acute calyx lobes, and shorter anther projections. In *G. hispiduala* the calyx is as long as or slightly longer than the bracteoles, the calyx lobes are broadly ovate and obtuse or subacute, and the anthers have distinct projections.

### 6.2.61 Taraxacum officinale

Dandelion - Kukraundha, Kanphool, Common dandelion, Dandelion
5 tin 9 cyuc 4 kcaak 3 tcan 3 dwat 0.5 m hkuc
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwissip hpa7tmwatli fyfxre7t hjonli

drutta Taraxacum officinale is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers. Leaves. RootEdible Uses: Coffee. TeaLeaves - raw or cooked[1, 2, 4, 5, 7, 9, 12, 14, 33, 154]. When used in salads, they are rather bitter, though less so in the winter. Tender young leaves are considerably less bitter than older leaves[K]. The leaves are often blanched (by excluding light from the growing plant) before use[183]. This will make them less bitter, but they will also contain less vitamins and minerals[K]. A very nutritious food, 100g of the raw leaves contain about 2.7g. protein, 9.2g. carbohydrate, 187mg Calcium, 66mg phosphorus, 3.1mg iron, 76mg sodium, 397mg potassium, 36mg magnesium, 14000iu vitamin A, 0.19mg vitamin B1, 0.26mg vitamin B2, 35mg vitamin C[173]. Root - raw or cooked[5, 9, 12, 183]. Bitter. A turnip-like flavour[159]. Flowers - raw or cooked[102, 159]. A rather bitter flavour[K], the unopened flower buds can be used in fritters[183] and they can also be preserved in vinegar and used like capers[7]. Both the leaves and the roots are used to flavour herbal beers and soft drinks such as ‘Dandelion and Burdock’[238]. The roots of 2 year old plants are harvested in the autumn, dried and roasted to make a very good coffee substitute[2, 4, 5, 12, 54, 159]. It is caffeine-free[213]. A pleasant tea is made from the flowers[12, 102]. They are also used to make wine - all green parts should be removed when making wine to prevent a bitter flavour[238]. The leaves and the roots can also be used to make tea.

tcanta Compost Cosmetic Dye Fruit ripening Latex MiscellanyThe flowers are an ingredient of ‘QR’ herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. A liquid plant feed can be made from the root and leaves[54]. A low quality latex, which can be used for making rubber, can be obtained from the roots of this plant. A magenta-brown dye is obtained from the root[141]. The plant releases ethylene gas, this stunts the growth of nearby plants and causes premature ripening of fruits[14, 18]. A distilled water made from the ligules (thin appendages at the base of the leaf blades) is used cosmetically to clear the skin and is particularly effective in fading freckles[7]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This species is a hybrid and will not breed true from seed. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden. Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -15°c[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200]. Often cultivated in the herb garden for its leaves, there are some named varieties. The flowers are rich in nectar and are very attractive to honey bees[200]. A good companion for most plants[54]. Special Features:Edible, Fragrant foliage, Not North American native, Suitable for dried flowers.

### 6.2.57 Gaultheria mucronata

Prickly heath

5 tlin 9 cyuc 4 kcaak 3 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta Gaultheria mucronata is an evergreen Shrub growing to 1.5 m (5ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The lilac-coloured fruit does not look tremendously edible, and the texture is somewhat like polystyrene - but the fruit of some forms is juicy, almost melts in the mouth, has a very pleasant slightly sweet flavour and makes a very good dessert fruit[K]. The fruit is up to 12mm in diameter[200].

tcanta Hedge HedgeThe plant can be used to make a low hedge[29]. A good ground cover plant for a sunny position, forming dense thickets[197]. They are best spaced about 60cm apart each way[208]. Plants can be cut back in the spring if they are becoming too lanky and open in growth[208].

dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and surface sow in a lime-free compost in a shady part of the greenhouse and keep moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°c, but the seedlings are liable to damp off. Watering them with care and making sure they get ample ventilation will reduce this risk. Watering them with a garlic infusion can help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts and so it might be wise to give them some protection in their first spring or two outdoors.. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins. ‘Drop’ the plants 12 months earlier by digging them up and replanting them deeper in the soil so that the branches are buried and

can form roots. This works best in a sandy soil[78]. It is best to pot up the divisions and grow them on in a lightly shaded position in the greenhouse until they are established. Plant them out in the summer. Layering in September/October. Takes 12 months[78].

nwatta Requires a light well-drained lime-free soil[11]. Requires a moist acid soil according to another report[184]. Prefers a sunny position[11] but succeeds in light shade though it fruits less well in such a position[182]. A very hardy plant, tolerating temperatures down to about -20°c[184]. Plants spread quite freely, forming thickets by means of suckers[182]. Plants sometimes have hermaphrodite flowers but are usually dioecious[208] and at least one male plant is required for every 5 or 6 females if fruit is required. A very ornamental shrub, there are many named varieties[182]. ‘Davis’s Hybrids’ is said to be hermaphrodite[182]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.58 Atriplex nuttallii

Nuttall’s Saltbush

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli kyucutp hwicli hrasjhsrlut hpa7tli flatprikli-wissliphsom hpa7tmwatli nyanhjen hjonli

drutta Atriplex nuttallii is an evergreen Shrub growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves and stems - cooked[161]. It is usually cooked with wheat[177]. The leaves and stems can be used to add a salty flavour to other cooked foods[257]. Seed - cooked. Used in piñole or ground into a meal and used as a thickener in making bread or mixed with flour in making bread.

tcanta None known

dwatta None known

propta Seed - sow April/May in a cold frame in a compost of peat and sand. The seed usually germinates in 1 - 3 weeks at 13°c[134]. Pot up the seedlings when still small into individual pots, grow on in a greenhouse for the first winter and plant out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy. Pot up as soon as they start to root (about 3 weeks) and plant out in their permanent positions late in the following spring[K]. Cuttings of mature wood of the current season’s growth, November/December in a frame. Very easy. Pot up in early spring and plant out in their permanent position in early summer[K].

nwatta Requires a light or medium well-drained but not too fertile soil in a sunny position[11, 200]. Tolerates saline and very alkaline soils[200]. Succeeds in a hot dry position. Some modern works treat this species as a synonym of *Atriplex gardneri* aptera. This plant has more or less annual stems produced from a woody base[11]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.59 Lomatium cous

Biscuitroot, Cous biscuitroot

5 tlin 12 cyuc 4 kcaak 1 tcan 0 dwat 0.1 m hkuc htut cyutli kyucutp hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Lomatium cous is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 6.2.29 Crataegus azarolus

Azarole

5 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 10 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfriph hpa7tli flatprikliwssliph hpa7tmwatli xre7t hjonli

drutta Crataegus azarolus is a deciduous Tree growing to 10 m (32ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies, preserves etc[1, 2, 3, 11, 34, 183]. The fruit can be used fresh or dried for later use. A pleasant acid taste[89]. In warm temperate areas the fruit develops more fruit sugars and has a fragrant sugary pulp with a slightly acid flavour[183]. It can be eaten out of hand. In cooler zones, however, the fruit does not develop so well and is best cooked or used in preserves[183]. The fruit is very variable in size and colour, it is up to 25mm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed ‘green’ (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them out in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. The azarole has long been cultivated for its edible fruit in S. Europe, though it is now going out of favour[3, 11]. There are some named varieties[46].

Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Hawthorns in general hybridize freely with other members of the genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 6.2.30 Pyrus pyrifolia culta

Asian Pear

5 tlin 9 cyuc 4 kcaak 0 tcan 1 dwat 10 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlutnyikfriph hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Pyrus pyrifolia culta is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105]. Crisp, juicy with a fine flavour[178]. The fruit contains about 6 - 9.5% sugar and up to 0.56% fruit acids[179].

tcanta None known

dwatta Antiseptic Astringent Febrifuge Nerveine PectoralAntiseptic, astringent, febrifuge, nerveine, pectoral[178].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year. The seed of pear cultivars will not usually breed true to type.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°c[200]. Cultivated for its edible fruit in China and Japan, there are many named varieties[183]. A hybrid between this plant and *P. communis* culta is more suitable for warmer climates[11].

### 6.2.31 Actinidia purpurea

Purple hardy kiwi

5 tlin 9 cyuc 4 kcaak 1 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Actinidia purpurea is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen in November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 105]. Sweet[177, 183, 200]. The fruit is up to 2.5cm long[198]. It contains a number of small seeds, but these are easily eaten with the fruit[K].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. Dormant plants are very hardy but young spring growth is susceptible to frost damage[160]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. This is a climbing plant, supporting itself by twining around branches etc[200]. This species is possibly no more than a form of *A. arguta*[198], differing in its longer narrower leaves[126, 200]. It is treated as a synonym of *A. arguta* in the draft Flora of China[266]. At least one named variety has been developed for its edible fruit[183]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.32 Ziziphus jujuba

Jujube  
5 tlin 10 cyuc 4 kcaak 3 tcan 3 dwat 10 m hkuc  
htut cyutli hgatkyucup hwicli hyhshrasjltunyk hpa7tli flat-prikliwslip hpa7tmwatli fyifxre7t hjonli

drutta Ziziphus jujuba is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. **kcakta Edible Parts:** Fruit LeavesEdible Uses: CoffeeFruit - raw or cooked[1, 2, 3, 100, 158]. Mealy and sweet[46]. A sourish-sweet flavour[174]. The fruit can be eaten fresh, dried like dates or cooked in puddings, cakes, breads, jellies, soups etc[183]. The dried fruit has the nicest taste[11, 132]. The fruits are often left to become wrinkled and spongy, which increases their sweetness, and are then eaten fresh or cooked[238]. The dried fruit can also be ground into a powder. This powder is used in the preparation of 'kochujang', a fermented hot pepper-soybean paste that resembles miso[183]. Fruits contain one or two seeds[238]. Average yields from wild trees in the Himalayas are 9.5kg per year[194]. The fruit contains about 8.7% sugars, 2.6% protein, 1.4% ash, 1.7% pectin and 1.3% tannin[194]. The fruit is about 25mm long, though it can be larger in cultivated varieties[200]. The fruit can be used as a coffee substitute[183]. Leaves - cooked. A famine food, they are only used when all else fails[179]. A nutritional analysis is available[218].

tcanta Charcoal Fuel Hedge Hedge WoodPlants can be grown as a hedge[178]. Wood - dense, hard, compact, tough. Used for turnery, agricultural implements etc[74, 146, 158]. It makes an excellent fuel[146] and a good charcoal[158]. Es-

palier: tree or other plants that is trained to grow flat against a support (such as a trellis or wall).

dwatta Anodyne Antidote Astringent Cancer Diuretic Emollient Expectorant Hypnotic Narcotic Pectoral Poulitice Refrigerant Sedative Skin Stomachic TonicJujube is both a delicious fruit and an effective herbal remedy. It aids weight gain, improves muscular strength and increases stamina[254]. In Chinese medicine it is prescribed as a tonic to strengthen liver function[254]. Japanese research has shown that jujube increases immune-system resistance. In one clinical trial in China 12 patients with liver complaints were given jujube, peanuts and brown sugar nightly. In four weeks their liver function had improved[254]. Antidote, diuretic, emollient, expectorant[11, 61, 174, 178, 194]. The dried fruits contain saponins, triterpenoids and alkaloids[279]. They are anodyne, anticancer, pectoral, refrigerant, sedative, stomachic, styptic and tonic[4, 176, 218]. They are considered to purify the blood and aid digestion[240]. They are used internally in the treatment of a range of conditions including chronic fatigue, loss of appetite, diarrhoea, pharyngitis, bronchitis, anaemia, irritability and hysteria[176, 238, 279]. The seed contains a number of medically active compounds including saponins, triterpenes, flavonoids and alkaloids[279]. It is hypnotic, narcotic, sedative, stomachic and tonic[147, 176, 218]. It is used internally in the treatment of palpitations, insomnia, nervous exhaustion, night sweats and excessive perspiration[176, 238]. The root is used in the treatment of dyspepsia[218]. A decoction of the root has been used in the treatment of fevers[4, 240]. The root is made into a powder and applied to old wounds and ulcers[240]. The leaves are astringent and febrifuge[4, 218]. They are said to promote the growth of hair[218]. They are used to form a plaster in the treatment of strangury[240]. The plant is a folk remedy for anaemia, hypertonia, nephritis and nervous diseases[218]. The plant is widely used in China as a treatment for burns[218].

propta Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires 3 months warm then 3 months cold stratification[113]. Germination should take place in the first spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant out in early summer. Root cuttings in a greenhouse in the winter[200]. Best results are achieved if a temperature of 5 - 10°C can be maintained[238]. Cuttings of mature wood of the current season's growth, November to January in a frame[238]. Division of suckers in the dormant season[174]. They can be planted out direct into their permanent positions if required.

nwatta Succeeds in most soils so long as they are well-drained[3, 200]. Prefers an open loam and a hot dry position[1, 3]. Succeeds in an alkaline soil[200]. Plants are fast growing, even in poor soils[146]. Plants are hardy to about -20°C[200]. Another report says that they are hardy to about -30°C when fully dormant[160]. The jujube is often cultivated in warm temperate zones for its edible fruit, there are many named varieties[50, 183]. The trees need a hot dry summer if they are to fruit well, which rather restricts their potential in a country like Britain[238, K]. The tree spreads by root suckers and self-sowing, often forming dense thickets. Where the climate suits it, the plant can escape from cultivation and become an invasive and problematic weed[274]. Trees are resistant to most pests and diseases[160]. Responds well to coppicing[146]. Trees form a deep taproot and should be planted into their permanent positions as soon as possible[200]. Fast growing and quick to mature, it can fruit in 3 - 4 years from seed[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 6.2.33 Prunus armeniaca

Apricot

5 tlin 7 cyuc 4 kcaak 4 tcan 3 dwat 9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

temperate. Humidity: arid to semi-arid. Carbon Farming Solutions - Cultivation: hypothetical - F. Esculentum could be crossed with *F. cymosum*. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

## 6.2.54 Campanula cochlearifolia

Fairies Thimbles

5 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli tcup hwicli hyhshrasjltut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Campanula cochlearifolia is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked. A pleasant mild flavour[K]. Flowers - raw or cooked. Slightly sweet[K].

tcanta None known

dwatta None known

propta Seed - surface sow spring in a cold frame. The seed usually germinates in 2 - 4 weeks at 18°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Very easy[221], larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta A very easily grown plant that succeeds in most situations so long as they are not both hot and dry[221]. In nature, the plant is found in poor soils and rock crevices and, in cultivation, when introduced to the richer conditions of the garden, is apt to spread by means of seeds and a creeping rhizome - indeed some gardeners consider it a pest even though it is beautiful and long-flowering[271]. It is probably best grown in a poor soil, indeed it grows happily in pure gravel and sand[271]. It succeeds on drystone walls where it can become invasive[200]. It does especially well on the top of walls where there are cracks for it to root into[219]. Prefers a moist but well-drained sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. Plants are hardy to at least -15°C[200]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile and often self-sow in the garden[221, 271]. There are several named varieties selected for their ornamental value[200]. 'Elizabeth Oliver' has pleasantly flavoured leaves[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.55 Peltaria alliacea

Garlic Cress

5 tlin 9 cyuc 4 kcaak 3 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Peltaria alliacea is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[105]. A strong flavour, somewhat

like a cross between garlic and mustard, the leaves make a reasonable flavouring for salads[K]. The leaves are available for most of the year, even in a severe winter they remain green and lush[K]. At this time they add an especially welcome spiciness to salads[K]. They can become rather bitter in the summer, though, especially if the plants are in a dry sunny position[K]. When flowering in early summer, the plants lose their leaves for a month or two - cutting down the flowering stems at this time will induce new fresh green growth[K]. Flowers - raw. A similar flavour to the leaves, with very little bitterness, they make a very tasty addition to summer salads[K].

tcanta The plants can be used as a ground cover, somewhat slow spreading but they are effective in excluding weeds[K].

dwatta None known

propta Seed - sow spring or autumn in a cold frame[200]. The seed germinates rapidly, prick the seedlings out into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer[K]. Division in spring or autumn. Very easy, it can be done at almost any time of the year so long as the soil is kept moist. Divisions in the winter should be potted up in a greenhouse to allow themselves to establish, they can then be planted out in late spring.

nwatta Prefers a light fertile moist soil in sun or light shade[200], though it is not too fussy[K]. A very easily grown plant that tolerates considerable neglect, it produces its best crop of leaves from autumn to spring and is a potentially valuable winter salad plant[K]. The bruised leaves give off a powerful garlic smell which is difficult to remove from the hands[245].

## 6.2.56 Thymus x citriodorus

Lemon Thyme, Creeping Lemon Thyme, Lemon-Scented Thyme

5 tlin 10 cyuc 4 kcaak 5 tcan 2 dwat 0.1 m hkuc  
htut cyutli kyuctcup hwicli hrasjltut hpa7tli prikliwis hpa7tmwatli xre7t hjonli

drutta Thymus x citriodorus is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: TeaLeaves - raw in salads or added as a flavouring to cooked foods[105, 183]. A delicious lemon flavour[K]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200]. An aromatic tea is made from the leaves[21]. It has a pleasant lemon-like flavour and is very refreshing[183, 238].

tcanta Deodorant Disinfectant Essential Pot-pourriThe essential oil obtained from the leaves and flowering stems is used in perfumery, as a mouth wash, medicinally etc[200]. The aromatic leaves are dried and used in pot-pourri and herbal pillows[238]. The plant makes an attractive ground cover for a sunny position[201]. They are best spaced about 30cm apart each way[208].

dwatta Antiseptic Aromatherapy Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238]. The leaves contain an antioxidant and regular use of the raw leaves has been shown to increase average life expectancy by about 10%. The essential oil obtained from this plant is thought to be less irritant than other thyme oils and so it is used in aromatherapy to treat asthma and other respiratory complaints, especially in children[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely



propta Seed - best sown in the autumn in a cold frame[200]. Seeds are short-lived and difficult to germinate. Stored seed requires 1 month warm stratification followed by 2 months cold[113]. When large enough to handle, prick the seedlings out into individual pots of lime-free compost and grow them on in light shade in a greenhouse or cold frame for at least their first winter. Plant out into their permanent positions in late spring or early summer when they are at least 15cm tall. Cuttings of half-ripe wood, July/August in a frame[200]. Layering. Division in spring.

nwatta Requires a lime-free moist peaty soil, thriving in sun or part shade[3, 182, 200]. Plants are hardy to about -15°C[200]. Occasionally cultivated for its edible fruit, there are some named varieties selected for their larger fruits[22, 46]. The small oval leaves are covered with globules on the underside from which a resinous gum is exuded[245]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 6.2.52 Atriplex hortensis

Orach, Garden orache  
5 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 1.8 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikwissiphosm hpa7tmwatli hjonli

drutta Atriplex hortensis is a ANNUAL growing to 1.8 m (6ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Leaves SeedEdible Uses: Leaves - raw or cooked[2, 16, 27, 33]. Used like spinach[9], they have a bland flavour and are traditionally mixed with sorrel leaves in order to modify the acidity of the latter[183]. Another report says that the flavour is stronger than spinach[264]. Seed - cooked. It can be ground into a meal and used in soups etc or be mixed with flour when making bread[177, 183]. The seed is said to be a good source of vitamin A[240]. The seed is also said to contain some saponins[240]. See the notes above on toxicity. The seed is small and fiddly to harvest and use.

tcanta Biomass Companion DyeA blue dye is obtained from the seed[74, 100]. The plant is a potential source of biomass. Yields of 14 tonnes per hectare have been achieved in the vicinity of Landskrona and Lund, Sweden. Higher yields might be expected farther south. If the leaf-protein were extracted, this should leave more than 13 tonnes biomass as by-product, for potential conversion to liquid or gaseous fuels[269].

dwatta Antirheumatic Diuretic Emetic PurgativeThe leaves are diuretic, emetic and purgative[100, 269]. They are also said to be a stimulant to the metabolism and an infusion is used as a spring tonic and a remedy for tiredness and nervous exhaustion[9]. They have been suggested as a folk remedy for treating plethora and lung ailments[269]. The leaves are said to be efficacious when used externally in the treatment of gout[4]. The seeds, mixed with wine, are said to cure yellow jaundice. They also excite vomiting[269]. The

fruits are purgative and emetic[269]. Liniments and emollients prepared from the whole plant, like the juice of the plant, are said to be folk remedies for indurations and tumours, especially of the throat[269].

propta Seed - sow March to August in situ, only just covering the seed[134]. Germination is usually good and rapid[K].

nwatta Orach is a very easily grown plant, doing equally well in a wide variety of well-drained soils, though rich, moisture-retentive soils give the quick growth that is necessary for the production of tender leaves[33, 37, 200, 269]. Plants require a position in full sun and are tolerant of saline and very alkaline soils[200]. They thrive in any temperate climate, and are drought resistant[269]. Orach is reported to tolerate an annual precipitation of 30 to 140cm, an average annual temperature in the range of 6 to 24°C, and a pH of 5.0 to 8.2[269]. Orach was formerly cultivated for its edible leaves, there are some named varieties[183]. It can be grown as a warm weather substitute for spinach[183]. Some forms of this species have bronze or deep red leaves and are occasionally grown as ornamental plants, their leaves taste the same as the green-leaved forms[K]. Plants are fast-growing[238] and usually self-sow quite freely if the surrounding soil is disturbed by hoeing etc[K]. They tolerate hot weather well, but soon go to seed so successive sowings at 4 weekly intervals are required during the growing season if a continuous supply of leaves is required[269]. Leaves can be harvested 40 - 60 days after sowing the seed[269]. This species is a poor companion plant for potatoes, inhibiting their growth when growing close to them[20].

## 6.2.53 Fagopyrum spp.

Perennial Buckwheat  
5 tlin 10 cyuc 4 kcaak 2 tcan 3 dwat 1 m hkuc  
hminhtut cyutli tcup hwicli hyihshrasjlutnykifrip hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Fagopyrum spp. is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Leaves - raw or cooked[105, 160, 272]. Boiled or steamed and used like spinach[183]. Of excellent quality according to one report[2], but we have been less than impressed by the flavour, which has a distinct bitterness especially when eaten raw[K]. The leaves are rich in rutin (see below for details of its uses) and so they do make a healthy addition to the diet[K]. Seed - it can be sprouted and eaten raw, or cooked and used as a cereal[4]. Dried and ground into a powder, it can serve as a thickening agent in soups etc. The seed is rich in vitamin B6. Unfortunately, it is not freely produced in Britain[2]. Carbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

tcanta Animal feed, An ornamental plant.  
dwatta The whole plant is anodyne, antihelmintic, antiphlogistic, carminative, depurative and febrifuge. It stimulates blood circulation[147]. A decoction is used in the treatment of traumatic injuries, lumbago, menstrual irregularities, purulent infections, snake and insect bites[147]. A decoction of the roots is used in the treatment of insect bites, dysmenorrhoea, inflammation, lumbago, snakebite and traumatic injuries[218]. The leaves are rich in rutin which is a capillary tonic, antioedemic, anti-inflammatory, antispasmodic and hypotensive[218]. Rutin also inhibits carcinogenesis and protects against radiation[218].

propta Seed - sow spring in a greenhouse. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in the summer. Division is very easy at almost any time in the growing season, though it is best avoided in early spring because the young growth can be damaged by late frosts. The divisions can be planted out direct into their permanent positions.

nwatta Hypothetical Crop Management: Standard Staple Crop: Balanced carbClimate: boreal to cold

drutta Prunus armeniaca is a deciduous Tree growing to 9 m (29ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to April, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Gum Oil OilFruit - raw, cooked or dried for later use[1, 2, 3, 34]. The best forms are soft and juicy with a delicious rich flavour[K]. Wild trees in the Himalayas yield about 47.5kg of fruit per year[194]. The fruit of the wild form contains about 6.3% sugars, 0.7% protein, 2.5% ash, 2.5% pectin. There is about 10mg vitamin C per 100g of pulp[194]. The fruit is about 5cm in diameter and contains one large seed[200]. Seed - raw or cooked[183]. Bitter seeds should be eaten in strict moderation, but sweet ones can be eaten freely[132]. The bitter seeds can be used as a substitute for bitter almonds in making marzipan etc[4]. An edible gum is obtained from the trunk[64]. The seed contains up to 50% of an edible semi-drying oil[4, 57, 61, 183].

tcanta Adhesive Dye Gum Oil Oil WoodAn edible semi-drying oil is obtained from the seed[57]. Used for lighting[194]. The oil has a softening effect on the skin and so it is used in perfumery and cosmetics, and also in pharmaceuticals[4, 61]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - handsome, hard, durable. Agricultural implements etc[146, 194]. Espalier: tree or other plants that is trained to grow flat against a support (such as a trellis or wall).

dwatta Analgesic Anthelmintic Antiasthmatic Antidote Antipyretic Antisepctic Antispasmodic Antitussive Demulcent Emetic Emollient Expectorant Laxative Ophthalmic Pectoral Sedative Tonic Vitamin C VulneryaryApricot fruits contain citric and tartaric acid, carotenoids and flavonoids[283]. They are nutritious, cleansing and mildly laxative[254]. They are a valuable addition to the diet working gently to improve overall health. The salted fruit is antiinflammatory and antiseptic[283]. It is used medicinally in Vietnam in the treatment of respiratory and digestive diseases[283]. Antipyretic, antiseptic, emetic, opthalmic[194]. The flowers are tonic, promoting fecundity in women[218]. The bark is astringent[254]. The inner bark and/or the root are used for treating poisoning caused by eating bitter almond and apricot seeds (which contain hydrogen cyanide)[218]. Another report says that a decoction of the outer bark is used to neutralize the effects of hydrogen cyanide[238]. The decoction is also used to soothe inflamed and irritated skin conditions[254]. The seed is analgesic, anthelmintic, antiasthmatic, antispasmodic, antitussive, demulcent, emollient, expectorant, pectoral, sedative and vulnerary[176, 218]. It is used in the treatment of asthma, coughs, acute or chronic bronchitis and constipation[176, 279]. The seed contains 'laetirile', a substance that has also been called vitamin B17[218]. This has been claimed to have a positive effect in the treatment of cancer, but there does not at present seem to be much evidence to support this[K]. The pure substance is almost harmless, but on hydrolysis it yields hydrocyanic acid, a very rapidly acting poison - it should thus be treated with caution[218]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Difficult[113]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Difficult. Layering in spring.

nwatta Global Fruit Crop Industrial Crop: Oil Management: Standard Staple Crop: Protein-oilLandscape Uses : Specimen, Espalier. Requires a well-

drained moisture-retentive fertile soil in a warm sunny position[11, 200]. Succeeds in light shade but fruits better in a sunny position[200]. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but is apt to become chlorotic if too much is present[11]. Prefers a pH in the range 6.5 to 7.5[200]. Dislikes clay soils[37, 61]. Intolerant of saline soils[200]. Trees drop their fruit buds if there is a summer drought[200]. The apricot is widely cultivated for its edible fruit in temperate areas that have long hot summers, there are many named varieties[183, 200]. The tree is perfectly hardy in Britain but it usually flowers very early in the spring and the flowers are then liable to be destroyed by frosts[11]. It really requires a more continental climate (with its clearly defined seasons) than it gets in Britain. However, if given the benefit of a south or west facing wall and some protection from frosts when it is in flower, reasonable crops can usually be produced in southern England[1, 219]. The plants are self-fertile[200], but hand pollination would be advisable since they are normally flowering before many pollinating insects are active. In Britain apricots are usually grown on plum rootstocks, 'St. Julien A' is the most widely used[200]. The dwarfing rootstock 'Pixie' is also a possibility, but this must be double worked with 'St. Julien A' because it is incompatible with apricots[200]. Any pruning should be carried out in the summer to allow rapid healing and therefore less risk of infection[201]. Oats should not be grown near apricots because their roots have an antagonistic effect on the roots of the apricot[201]. Tomatoes and potatoes are also bad companions for apricots[201]. If nasturtiums (Tropaeolum spp) are grown under apricots they will make the fruit less palatable to insects, though this is not detectable by the human palate[201]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Edible, Not North American native, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 6.2.34 Akebia trifoliata

Akebia, Threelaf Akebia  
5 tlin 8 cyuc 4 kcaak 2 tcan 2 dwat 9 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Akebia trifoliata is a deciduous Climber growing to 9 m (29ft 6in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw. Sweet but insipid[2, 3, 46, 61, 105]. The fruit has a delicate flavour and a soft juicy texture[K]. The flavour can be enhanced by the addition of a little lemon juice. Valued more as a novelty, the fruit looks somewhat like a deep-purple coloured sausage[183]. The fruit is 7 - 13cm long[200]. The dried young leaves are used as a tea substitute[46, 61, 105, 183].

tcanta BasketryThe peeled stems are very pliable. They can be bleached and used in basket making[46, 61]. Landscape Uses: Arbor. The flowers are purple. The flowers have

a sweet scent.

dwatta Analgesic Antibacterial Antifungal Antiinflammatory Antitumor Blood tonic Cardiotoxic Diuretic Emmenagogue Galactagogue UrinaryThe stems are analgesic, antibacterial, antifungal, anti-inflammatory, antitumor. blood tonic, cardiotoxic, diuretic, emmenagogue and galactagogue[147, 176]. Taken internally, it controls gram-positive bacterial and fungal infections and is used in the treatment of urinary tract infections, lack of menstruation, to improve lactation etc[176, 238]. The stems are harvested in the autumn and dried for later use[238].

propta Seed - best sown in a cold frame as soon as it ripe. Surface sow in a light position[133]. The seed usually germinates in 1 - 3 months at 15°C[133]. Stored seed should be given 1 month cold stratification[113, 133] and can be very difficult to germinate. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[11, 113]. The cuttings can be slow to root[200]. Cuttings can also be taken of soft wood in spring[113]. Root cuttings, December in a warm greenhouse[113]. Layering in early spring[1]. Very easy, the plants usually self-layer and so all you need to do is dig up the new plants and plant them out directly into their permanent positions.

nwatta Requires a well-drained moisture-retentive loamy soil[11, 200]. Succeeds in acid or alkaline soils[200]. Prefers partial shade but succeeds in full sun[3, 200]. Grows well on a north facing wall[219]. Dormant plants are hardy to about -20°C but they can be somewhat tender when young[200]. Another report says that this species is not as hardy as *A. quinata*, only tolerating temperatures down to -10°C. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species grows very well in S.W. England. Resentful of root disturbance, either grow plants in containers prior to planting them out or plant them out whilst very young[219]. Plants are evergreen in mild winters[11]. Fast growing, it can be invasive. It grows well on deciduous trees[28]. Plants are not normally pruned, if they are growing too large they can be cut back by trimming them with shears in early spring[202]. Plants are shy to fruit, they possibly require some protection in the flowering season, hand pollination is advisable[3, 11]. Plants are probably self-sterile[182], if possible at least 2 plants should be grown, each from a different source. The flowers are sweetly scented[245]. The fruits are sold in local markets in Japan[46]. The ssp. *A. trifoliata australis*. (Diels.)Rehd. is used medicinally in China[176]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 6.2.35 Prunus cerasifera

Cherry Plum, Myrobalan Plum, Newport Cherry Plum, Pisard Plum

5 tlin 8 cyuc 4 kcaak 3 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatprik-lwis hpa7tmwatli xre7t hjonli

drutta Prunus cerasifera is a deciduous Tree growing to 9 m (29ft) by 9 m (29ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower in March, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked in pies, tarts, jams etc[2, 5, 12, 34, 183]. The size of a small plum with a thin skin and a nice sweet flavour[183]. The flesh is somewhat mealy but is also juicy[K]. The fruit can hang on the tree until October[K]. The fruit is about 30mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye Hedge Hedge Rootstock ShelterbeltA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Makes quite a good windbreak hedge though it cannot stand too much exposure[1, 11, 29]. Often used as a rootstock for the cultivated plums, giving them a semi-dwarfing habit[61].

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Desperation', 'Fear of losing control of the mind' and 'Dread of doing some frightful thing'[209]. It is also one of the five ingredients in the 'Rescue remedy'[209]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame. Softwood cuttings from strongly growing plants in spring to early summer in a frame. Layering in spring. Division of suckers in the dormant season. They can be planted out direct into their permanent positions.

nwatta Landscape Uses:Specimen. Requires a well-drained moisture retentive soil[1, 11]. Succeeds in light shade but fruits better in a sunny position[11, 200]. Thrives in a loamy soil, doing well on limestone[11]. Grows well in heavy clay soils. Prefers some chalk in the soil but apt to become chlorotic if too much is present[1]. A very ornamental plant[1], it is sometimes cultivated for its edible fruit, unfortunately this is not often borne in large quantities in Britain[3, 17], but large crops are produced every 4 years or so[K]. There are some named varieties[183]. Included as a part of *P. divaricata* by some botanists[11] though others include *P. divaricata* as a sub-species under this species[200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features:Attractive foliage, Not North American native, All or parts of this plant are poisonous, Blooms are very showy. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A sprouting standard sending up shoots from the base [1-2].

## 6.2.36 Pinus cembroides

Mexican Pine Nut, Pinyon Pine

5 tlin 8 cyuc 4 kcaak 4 tcan 2 dwat 8 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus cembroides is an evergreen Tree growing to 8 m (26ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

back and legs[176]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214]. The seed is used as a haemostat for the control of bleeding, with a special action on the kidneys and sex organs[218]. The root bark is antibacterial, antipyretic, hepatic, hypoglycaemic and vasodilator[176]. It stimulates the parasympathetic nervous system, which controls involuntary bodily functions such as digestive secretions[254]. The root is used in the treatment of pulmonary tuberculosis and pneumonia in small children[147], chronic febrile disease, night sweats, cough and asthma, tuberculosis, hypertension and diabetes mellitus[176]. The root can be harvested at any time of the year but traditionally it is harvested in the spring and can be dried for later use[254]. The root bark contains betaine. This can increase the rate of growth of farm animals and increase the weight and amount of eggs, it is used in the treatment of achlorhydria, atherosclerosis and hepatic diseases[176]. Haemostatic[174].

propta Seed - sow early spring in a greenhouse. Germination is usually good and fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Pinch out the shoot tips of the young plants in order to encourage bushy growth[78]. Cuttings of half-ripe wood, 5 - 10cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, autumn to late winter in a cold frame. High percentage[78, 200]. Division of suckers in late winter. Very easy, the suckers can be planted out direct into their permanent positions. Layering.

nwatta An easily grown plant, it does not require a rich soil, flowering and fruiting better in a well-drained soil of moderate quality[1, 11, 200]. Succeeds in impoverished soils[200]. Requires a sunny position[200]. Tolerates maritime exposure[200]. A very hardy plant, tolerating temperatures down to about -23°C[200]. This species is widely cultivated for its edible young shoots in China. There is much confusion between this species and the closely related *L. barbarum*. Most, if not all, of the plants being grown as *L. chinense* in Britain are in fact *L. barbarum*[11, 50, 200].

## 6.2.50 Abelmoschus esculentus

Okra

5 tlin 11 cyuc 4 kcaak 2 tcan 3 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlisslip hpa7tmwatli xre7t hjonli

drutta Abelmoschus esculentus is an ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit Leaves Oil Root SeedEdible Uses: Coffee Oil PectinImmature fruit - cooked on their own or added to soups etc[2, 27]. They can be used fresh or dried[183]. Mucilaginous[133], they are commonly used as a thickening for soups, stews and sauces[183]. The fruits are rich in pectin and are also a fair source of iron and calcium[240]. The fresh fruits contain 740 iu vitamin A[240]. The fruit should be harvested whilst young, older fruits soon become fibrous[133]. The fruit can be up to 20cm long[200]. Seed - cooked or ground into a meal and used in making bread or made into 'tofu' or 'tempeh'[183]. The roasted seed is a coffee substitute[2, 27, 133]. Probably the best of the coffee substitutes[74]. The seed contains up to 22% of an edible oil[55, 74, 177, 183, 240]. The leaves, flower buds, flowers and calyces can be eaten cooked as greens[183]. The leaves can be dried, crushed into a powder and stored for later use[183]. They are also used as a flavouring[133]. Root - it is edible but very fibrous[144]. Mucilaginous, without very much flavour[144].

tcanta Fibre Oil Paper Pectin SizeA fibre obtained from the stems is used as a substitute for jute[57, 61, 74, 169]. It is also used in making paper and textiles[171]. The fibres are about 2.4mm long[189]. When used for paper the stems are harvested in late summer or autumn after the edible seed-pods have been harvested, the leaves are removed and the stems are steamed until the fibres can be stripped off. The fibres are cooked for 2 hours with lye and then put in a ball mill for 3 hours. The paper is cream coloured[189]. A decoction of the root or of the seeds is used as a size for paper[178].

dwatta Antispasmodic Demulcent Diaphoretic Diuretic Emollient Stimulant VulneraryThe roots are very rich in mucilage, having a strongly demulcent action[4, 21]. They are said by some to be better than marsh mallow (*Althaea officinalis*)[4]. This mucilage can be used as a plasma replacement[240]. An infusion of the roots is used in the treatment of syphilis[240]. The juice of the roots is used externally in Nepal to treat cuts, wounds and boils[272]. The leaves furnish an emollient poultice[4, 21, 240]. A decoction of the immature capsules is demulcent, diuretic and emollient[240]. It is used in the treatment of catarrhal infections, ardor urinae, dysuria and gonorrhoea[240]. The seeds are antispasmodic, cordial and stimulant[240]. An infusion of the roasted seeds has sudorific properties[240].

propta Seed - sow early spring in a warm greenhouse. The seed germinates in 27 days at 15°C or 6 days at 35°C[133]. When large enough to handle, prick them out into individual pots and plant them out after the last expected frosts[200].

nwatta Industrial Crop: Fiber Management: Cop-pice Management: Standard Regional Crop Staple Crop: Protein-oilPrefers a well-drained humus rich fertile soil in full sun and a pH around 6 to 6.7[200] but it tolerates a wide range of soil types and pH from 5.5 to 8[200]. It prefers a soil with a high potash content[264]. The plant requires a warm sunny position sheltered from winds[200]. It likes plenty of moisture, both in the soil and in the atmosphere[133]. Okra is commonly cultivated in warm temperate and tropical areas for its edible seedpod, there are many named varieties[183, 200]. Most cultivars require about 4 months from sowing before a crop is produced, though some early maturing varieties can produce a crop in 50 days in the tropics[264]. This species is not very hardy in Britain, it sometimes succeeds outdoors in hot summers but is really best grown in a greenhouse since it prefers daytime temperatures of 25°C or more[260]. Plants also dislike low night temperatures[133]. There are some early-maturing varieties that are more tolerant of cooler temperate conditions and these could be tried outdoors[200]. These include 'Clemson's Spineless', 'Emerald Spineless', 'Long Green' and 'Green Velvet'[200]. The flowers are much visited by bees but they may require syringing in order to improve fertilization when plants are grown in a greenhouse. Plants resent being transplanted[133].

## 6.2.51 Gaylussacia baccata

Black Huckleberry

5 tlin 9 cyuc 4 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaylussacia baccata is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 55]. Deliciously spicy and sweet, they can be eaten out of hand or used in pies, preserves etc[183]. They can also be dried for later use[62]. The dried fruit can be ground into a powder then mixed with cereal flours to make bread[257]. The fruit is rather seedy[235]. The fruit is about 8mm in diameter[200].

tcanta MiscellanyNone known

dwatta Astringent Dysentery MiscellanyAn infusion of the leaves, or the bark, has been used in the treatment of dysentery[257]. An infusion of the leaves has been used in the treatment of Bright's disease[257].

neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers Fruit**Edible Uses:** Fruit - raw or cooked[145]. A well-flavoured fruit, it has a sweet taste with a blend of acid, though there is a slight bitterness caused by the seeds[194, K]. The fruit is much liked by children[194, K]. It is dried and used like raisins in India[2, 3, 177, 183]. The fruit contains about 2.3% protein, 12% sugars, 2% ash, 0.6% tannin, 0.4% pectin[194]. There is 4.6mg vitamin C per 100ml of juice[194]. The fruit is about 7mm x 4mm[194] - it can be up to 10mm long[200]. Plants in the wild yield about 650g of fruit in 4 pickings[194]. Flower buds - added to sauces[177, 183].

**tcanta Dye Fuel Tannin**A yellow dye is obtained from the root and the stem[46, 61, 272]. An important source of dyestuff and tannin, it is perhaps one of the best tannin dyes available in India[194]. The wood is used as a fuel[146]. The spiny branches are used for making fencing around fields[272].

**dwatta Alternative Antibacterial Antiperiodic Bitter Cancer Deobstruent Diaphoretic Dysentery Laxative Malaria Ophthalmic Tonic Vitamin C**The dried stem, root bark and wood are alternative, antiperiodic, deobstruent, diaphoretic, laxative, ophthalmic and tonic (bitter)[46, 61, 158, 194, 240]. An infusion is used in the treatment of malaria, eye complaints, skin diseases, menorrhagia, diarrhoea and jaundice[240, 243]. Berberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licuorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

**propta Seed** - best sown as soon as it is ripe in a cold frame, it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78]. Stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for at least their first winter. Once they are at least 20cm tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are subject to damping off, so be careful not to overwater them and keep them well ventilated[113]. Cuttings of half-ripe wood, July/August in a frame. Very difficult, if not impossible. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Very difficult, if not impossible.

**nwatta** Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Plants are very hardy, they survived the severe winters of 1986-1987 without problems in most areas of Britain[K]. Plants can be pruned back quite severely and resprout well from the base[200]. The fruits are sometimes sold in local markets in India[194]. Hybridizes freely with other members of this genus[1]. Most plants cultivated under this name are *B. chitria*, *B. coriaria*, *B. glaucocarpa*. and, more commonly, *B. floribunda*[67, 200].

## 6.2.48 Hydrangea serrata amagiana

5 tlin 9 cyuc 4 kcaak 2 tcan 0 dwat 2 m hkc hmimhtut cyuti tcup hwicli hrasjltunyk hpa7tli frusflatprklwis hpa7tmwatli xre7t hjonli

**drutta** Hydrangea serrata amagiana is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Leaves**Edible Uses:** SweetenerThe young leaves, even without fermentation[174], are very

sweet and are used to make a sweet tea called 'tea of heaven', it is used in Buddhist ceremonies[174]. The leaves contain phellodulcin (its chemical formula is C16 H14 O), a very sweet substance that can be used as a sugar substitute[174]. The older leaves can be dried, powdered and used as a flavouring on foods[174]. The young leaves and shoots are also eaten cooked[174].

**tcanta Hedge Hedge**Can be grown as a low hedge[29], it is quite wind tolerant.

**dwatta None known propta Seed** - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

**nwatta** Tolerates most soil[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Does well on very acid soils with a pH around 4.5[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil. Best grown in an acid soil, doing well on very acid soils (pH 4.5). There is some confusion over the correct name for this plant. We have used the name in [174] but the Flora of Japan[58] says that the correct name is *H. macrophylla angustata*. Plants are hardy to about -25°C when dormant[200], but the young growth in spring can be killed by late frosts[K]. This species is notably susceptible to honey fungus[200].

## 6.2.49 Lycium chinense

Chinese Boxthorn, Chinese desert-thorn

5 tlin 9 cyuc 4 kcaak 3 tcan 3 dwat 2.5 m hkc htut cyuti tcup hwicli hyhshrasjltunyk hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

**drutta** Lycium chinense is a deciduous Shrub growing to 2.5 m (8ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** Fruit Leaves Seed Shoots**Edible Uses:** Coffee TeaFruit - raw, cooked in soups etc or dried for later use[174, 178, 183]. Sweet with an aniseed-like flavour[183]. The fruit is an oblong berry about 15mm long by 8mm wid[266]. Only the fully ripe fruits should be eaten[K]. Leaves and young shoots - raw or cooked[61, 174, 178]. A peppermint-like flavour, the leaves are used in salads or used as a potherb[183]. Rich in vitamin A, the leaves also contain about 3.9% protein, 2.25% carbohydrate, 0.7% fat, 1.4% ash[179]. The roasted seed is a coffee substitute[183]. The dried leaves are a tea substitute[183].

**tcanta Hedge Hedge** Soil stabilizationCan be grown as an informal hedge, succeeding in maritime exposure[200]. Plants have an extensive root system and can be planted to stabilize banks[200].

**dwatta** Antibacterial Antipyretic Cancer Haemostatic Hepatic Hypoglycaemic Infertility Kidney Ophthalmic Tonic VasodilatorChinese boxthorn is a major Chinese tonic herb with a history of almost 2,000 years of medicinal use[254]. Both the berries and the root are used and traditionally the plant is believed to promote long life[254]. The fruit is one of the most popular tonics used in Chinese herbal medicine[176, 218]. A decoction is used to clear the vision, strengthen the kidneys, restore semen and nourish the liver[147]. The fruit protects the liver from damage caused by exposure to toxins[254]. It is also used in the treatment of diabetes mellitus, vertigo, nocturnal emissions and aching

**kcakta Edible Parts:** Inner bark Seed**Edible Uses:** CondimentSeed - the oily seed kernel is eaten raw, roasted, ground into a powder for making bread, cakes etc or made into a nut butter[1, 2, 11, 34, 62, 63, 92, 94, 183]. An excellent flavour[227]. A good size, the seeds are up to 15mm long[200]. Said to be the highest in protein and lowest in starch of all the piñons[183]. The seed contains about 14.6% protein, 62% fat. 17.3% carbohydrate[85]. This species provides a major source of seeds for sale in Mexico[229]. Inner bark - only used in times of dire need[85]. There are no more details but inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

**tcanta Adhesive Dye Herbicide Pitch Wood**A tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. A gum pitch is used as a glue for waterproofing and repairing pottery[117, 227]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - soft, light, close-grained[82]. Somewhat fragrant when burnt[227]. Used for fuel and posts, but rarely for lumber[227].

**dwatta Poulitice**The gum exuding from damaged areas of the tree is used to treat sore throats[92, 117]. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

**propta** It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

**nwatta** Management: Standard Regional Crop Staple Crop: Protein-oilLandscape Uses:Pest tolerant, Screen, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought, succeeding in hot, dry positions[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. A slow growing plant[81, 120], it takes 25 years

from seed before cones are formed[117]. The tree takes 250 - 350 years to reach full maturity[181]. The cones open and shed their seed whilst still attached to the tree[226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. This species is sometimes held to include a number of very similar species which are here treated as separate entities[81, 82]. See *P. edulis*, *P. monophylla* and *P. quadrifolia*. These species differ mainly in the number of leaves in a bundle[1]. The sub-species *P. cembroides* *orizabensis*. D. Baill. has larger seeds than the type[200]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms.

## 6.2.37 Cydonia oblonga

Quince

5 tlin 9 cyuc 4 kcaak 3 tcan 2 dwat 7.5 m hkc pcimhmimhtut cyuti tcup hwicli hrasjltunyk hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

**drutta** Cydonia oblonga is a deciduous Tree growing to 7.5 m (24ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Flowers Fruit**Edible Uses:** Drink Gum Pectin PectinFruit - raw or cooked[4]. When grown in warm temperate or tropical climates, the fruit can become soft and juicy and is suitable for eating raw[4]. In cooler climates such as Britain, however, it remains hard and astringent and needs to be cooked before being eaten[4]. It is used in jellies, preserves etc[9, 183]. The cooked fruit adds a delicious flavour to cooked apples[3, 37, 46, 61]. Strongly aromatic with a firm but rather gritty flesh[200]. The fruit is rich in pectin[200]. The fruit is about 10m long and 9cm wide, tapering to the stalk[200]. A nutritional analysis is available[218]. A drink can be made by adding the dried crushed seed to water, simmering for 5 minutes and sweetening to taste[183]. Flowers[183]. No further details are given.

**tcanta Gum Pectin Pectin Rootstock** SizeA mucilage obtained from the seed coat is used as a gum arabic substitute to add gloss to material[61, 74]. The seed contains 20% mucilage and 15% fatty oils[74]. The fruit is rich in pectin[200]. Pectin is said to protect the body against radiation[201]. The leaves contain 11% tannin[240].

**dwatta** Antiinflammatory Antivinous Astringent Cardiac Carminative Demulcent Digestive Diuretic Emollient Expectorant Hypotensive Laxative Pectoral Refrigerant Restorative Stimulant TonicThe stem bark is astringent, it is used in the treatment of ulcers[218]. The seed is a mild but reliable laxative, astringent and anti-inflammatory[9]. When soaked in water, the seed swells up to form a mucilaginous mass. This has a soothing and demulcent action when taken internally[4] and is used in the treatment of respiratory diseases, especially in children[240]. This mucilage is also applied externally to minor burns etc[9]. The fruit is antivinous, astringent, cardiac, carminative, digestive, diuretic, emollient, expectorant, pectoral, peptic, refrigerant, restorative, stimulant and tonic[4, 9, 46, 218]. The unripe fruit is very astringent, a syrup made from it is used in the treatment of diarrhoea and is particularly safe for children[4, 254]. The fruit, and its juice, can be used as a mouthwash or gargle to treat mouth ulcers, gum problems and sore throats[254]. The leaves contain tannin and pectin[240]. Tannin can be used as an astringent whilst pectin has a beneficial effect on the circulatory system and helps to reduce blood pressure[K].

**propta** Seed - probably best sown in a cold frame as soon as it is ripe[K], it can also be sown in February[78]. It requires stratification[98], pre-chill the seed for 18 weeks if it is fresh, whilst old seed will require 2 weeks of warm stratification first and then 18 weeks cold treatment[164]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out into their permanent

positions in late spring or early summer, after the last expected frosts. Cuttings of mature wood, November in a cold frame[3, 37]. Layering in spring. Takes 1 year[78]. Suckers, removed in spring[200].

nwatta Succeeds in most soils but prefers a light moist fertile soil and a sunny position[3, 37, 200]. Dislikes very dry or waterlogged soils[202]. Succeeds in semi-shade but does not fruit so well in such a position[202]. Plants also tolerate quite deep shade[219], though they will often not fruit at all in such a position[K]. Plants are hardy to about -15°C[202], though the fruit seldom ripens in the north of Britain unless it is grown against a sunny wall[4]. The quince has been cultivated for over two thousand years for its edible fruit and its seed, though it is not a widely grown crop[4, 46, 61, 132]. It is also much used as a dwarfing rootstock for pears and some other fruits[200]. There are some named varieties[200]. Plants require warm summers in order to fully ripen their fruit[200]. The var. 'Maliformis' ripens well in cooler summers[200]. The plant is heat tolerant in zones 9 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

## 6.2.38 Mespilus germanica

Medlar  
5 tlin 8 cyuc 4 kcaak 1 tcan 1 dwat 6 m hkuc  
hmimhtut cyutil tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta Mespilus germanica is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 5, 7, 12]. The fruit does not always ripen fully in cooler temperate zones such as Britain. However it can be harvested in late autumn (preferably after it has had some frost) whilst still hard and then needs to be bletted before it can be eaten raw. This entails storing it, stalk end up wards, in a cool place for a short while until it is on the point of (but not quite) rotting[200], a state described as incipient decay. At this stage the flesh turns from white to brown, becomes very soft and is quite sweet with an absolutely delicious flavour that somewhat resembles a luscious tropical fruit[K]. The fruit of the wild species is up to 25mm in diameter, though some cultivars can be 65mm or more in diameter[200].

tcanta WoodWood - hard, flexible[100].

dwatta Astringent LaxativeThe pulp of the fruit is laxative[7]. The leaves are astringent[7]. The seed is lithontripic[7]. It is ground up for use, but caution should be employed since the seeds contain the toxin hydrocyanic acid[7]. The bark has been used as a substitute for quinine, but with uncertain results[7].

propta Seed - best sown as soon as it is ripe in late autumn in a cold frame[78]. The seed has a very hard and impermeable seedcoat and will not usually germinate until it has gone through two winters. Commercially, such seeds are soaked for a short while in sulphuric acid to break down the seed coat and allow the seed to take up moisture, this is a

very delicate procedure and difficult to do on a small scale. A home gardener could try soaking the seed for 24 hours in warm water then cold stratifying it for 2 - 3 months at 1 - 5°C before sowing it. Alternatively, if you can harvest the seed green (as soon as it is mature but before the seed coat has dried and hardened), then sow it immediately in a cold frame you might reduce the time needed for it to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of mature wood, November in a cold frame. Poor percentage. Layering in autumn or early spring. Takes 18 months[78].

nwatta Succeeds in most soils[11], preferring one that is moist and well-drained[1, 37, 200]. Prefers a sunny position[1, 3] and a fertile soil[188]. Occasionally cultivated for its edible fruit, there are some named varieties[183, 200]. The plant is heat tolerant in zones 9 through 6. (Plant Hardness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.39 Humulus lupulus

Hop, Common hop, European Hop,  
5 tlin 7 cyuc 4 kcaak 3 tcan 5 dwat 6 m hkuc  
hmimhtut cyutil hqatkyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Humulus lupulus is a PERENNIAL CLIMBER growing to 6 m (19ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: Leaves Root ShootsEdible Uses: Drink Rutin TeaYoung leaves and young shoots - cooked[2, 4, 5, 7, 9, 33, 37]. The flavour is unique and, to many tastes, delicious[183]. Young leaves can be eaten in salads[1, 183]. Use before the end of May[12]. The leaves contain rutin[218]. The fleshy rhizomes are sometimes eaten[183]. A tea is made from the leaves and cones[183]. It has a gentle calming effect[4]. The dried flowering heads of female plants are used as a flavouring and preservative in beer[2, 183]. They are also medicinal[2]. The flowering heads are sprinkled with bitter-tasting yellow translucent glands, which appear as a granular substance[4]. This substance prevents gram-negative bacteria from growing in the beer or wort[269]. Much of the hop's use as a flavouring and medicinal plant depends on the abundance of this powdery substance[4]. The seeds contain gamma-linolenic acid, an essential fatty acid that is said to have many important functions in the human body and is rarely found in plant sources[218]. The essential oil in the flowering heads is used as a flavouring in cereal beverages and mineral waters[269]. Extracts from the plant, and the oil, are used as flavouring in non-alcoholic

drutta Prunus angustifolia watsonii is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[1, 11]. An acid taste, the fruit is often used for making preserves, pies etc[183]. A reasonable size, it is about 14mm x 9mm and contains a single large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta DyeA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - heavy, rather soft, not strong[82]. It weighs 43lb per cubic foot[235] and is of little commercial value[229].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[1, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Unlike the type species, this sub-species thrives in Britain[11]. The flowers, which appear just before the leaves unfold, have a refreshing fruity scent[245]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 6.2.46 Hibiscus syriacus

Rose Of Sharon, Althaea, Shrub Althaea, Hardy Hibiscus  
5 tlin 9 cyuc 4 kcaak 2 tcan 2 dwat 3 m hkuc  
hmimhtut cyutil tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Hibiscus syriacus is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves Oil RootEdible Uses: Oil TeaYoung leaves - raw or cooked[2, 177, 179, 183]. A very mild flavour, though slightly on the tough side, they make an acceptable addition to the salad bowl[K]. A tea is made from the leaves[2, 177, 240] or the flowers[183]. Flowers - raw or cooked[74, 105, 183]. A mild flavour and mucilaginous texture, they are delightful in salads, both for looking at and for eating[K]. Root - it is edible but very fibrous[144]. Mucilaginous, without very much flavour[144].

tcanta Dye Fibre Hair Hedge Hedge OilA low quality fibre is obtained from the stems. It is used for making cordage and paper[74]. The seed contains about 25% oil[74]. No further details are given, but it is likely to be edible. A hair shampoo is made from the leaves[74]. A blue dye is obtained from the flowers[168]. This species is planted as a hedge in S. Europe[50].

dwatta Anthelmintic Antiphlogistic Antipruritic Demulcent Diuretic Dysentery Emollient Expectorant Febrifuge Ophthalmic Skin Stomachic StypticThe leaves are diuretic, expectorant and stomachic[218, 240]. A decoction of the flowers is diuretic, ophthalmic and stomachic[147, 178, 218]. It is also used in the treatment of itch and other skin diseases[240], dizziness and bloody stools accompanied by much gas[147]. The bark contains several medically active constituents, including mucilage, carotenoids, sesquiterpenes and anthocyanidins[279]. A decoction of the root bark is antiphlogistic, demulcent, emollient, febrifuge, haemostatic and vermifuge[218, 240]. It is used in the treatment of diarrhoea, dysentery, abdominal pain, leucorrhoea, dysmenorrhoea[240, 279] and dermatophytosis[147].

propta Seed - sow early spring in a greenhouse. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in late spring or early summer. Some reports say that the seed can be sown in situ outside and that it gives a good rate of germination[78, 80, 113]. Cuttings of half-ripe wood, July/August in a frame. Good percentage[113]. Cuttings of mature wood, early autumn in a frame. Good percentage[113]. Layering in mid summer to early autumn[1].

nwatta Landscape Uses:Border, Container, Foundation, Standard, Seashore, Specimen. Prefers a well-drained humus rich fertile soil in a sheltered position in full sun[200]. Succeeds in any soil of good or moderate quality[111]. Dislikes shade or badly drained soils[111]. Plants grow best with their roots in cool moist soil and their tops in a hot sunny position. This species is hardy to about -20°C[200] but plants only really succeed in the warmer counties of Britain because of their late flowering habit[184]. When planted in colder areas of the country, they will need protection for the first few winters[200]. The flowers only open in sunny weather[219]. Plants rarely require pruning[219], though they respond well to pruning and trimming and this is best carried out in the spring or just after flowering[219]. Plants are late coming into leaf, usually around the end of May or early June[182]. A very ornamental plant[1], there are many named varieties[182]. Special Features:Attracts birds, Not North American native, Naturalizing, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 6.2.47 Berberis aristata

Chitra, Indian Barberry or Tree Turmeric  
5 tlin 9 cyuc 4 kcaak 3 tcan 3 dwat 3.5 m hkuc  
hmimhtut cyutil kyuctcup hwicli hyishrasljutnyikrip hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta Berberis aristata is an evergreen Shrub growing to 3.5 m (11ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid,

string[61, 82, 227, 257]. The seed has insecticidal properties[222]. A yellow dye is made from the ripe flesh of the fruit[229]. Wood - light, soft, weak, spongy, coarse grained[82]. It weighs 24lb per cubic foot[227]. It is not used commercially[229]. Landscape Uses: Border, Pest tolerant, Specimen, Woodland Forest garden - a good understory tree. Shelter for wildlife [1-2].

dwatta Antiemetic Diuretic Emetic Laxative Narcotic ParasiticideThe fruit is used as a laxative[222]. The leaves are diuretic[222]. They are applied externally to boils, ulcers and abscesses[4, 222]. The seed contains the alkaline asininine, which is emetic and narcotic[222, 227]. They have been powdered and applied to hair to kill lice[222]. The bark is a bitter tonic[4]. It contains the alkaline anolabine, which is used medicinally[227].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. The seed usually germinates in 1 - 3 months at 15°C[134]. Stored seed requires stratification, it has embryo dormancy and an impermeable seedcoat and can take up to 18 months to germinate[113, 134]. Dried seed quickly loses its viability. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for a least their first winter. If trying them outdoors, plant them into their permanent positions in early summer once the plants are more than 15cm tall. Consider giving them some protection from winter cold for their first winter outdoors. Layering.

nwatta Pawpaw is a forest understory tree. Prefers a rich loamy soil with plenty of moisture and a sunny position[1, 134, 160]. Full sun to part shade. Pawpaw is shade tolerant and would prefer some afternoon shade from other trees or perhaps the shade of a building. Spreads by root suckers to form colonies, so give it room to spread (nfs.unl.edu). Plants are hardy to about -20°C according to one report[184], whilst another says that they are hardy to -35°C when fully dormant[160]. The papaw produces a delicious edible fruit which is a potentially commercial crop[61]. The wild-collected fruit is often sold in local markets in America[82]. The tree commences bearing in 4 - 6 years from seed and yields up to 30 kilos per tree[160]. There are some named varieties[183]. The mature fruit is rarely seen in Britain[182], only ripening after a long hot summer[200]. A small tree growing against a south-facing wall at Bristol Botanical Gardens had a small crop of immature fruit in early September 1996 (following the hot summer of 1995) - this was the first time it had been seen to bear fruit[K]. Flowers are formed in the leaf axils of wood produced the previous summer[82, 229]. Established plants resent root disturbance, the best plants are obtained by planting them out into their permanent positions as young as possible though young plants should be given some protection for their first year or two[200]. The leaves emit a heavy unpleasant odour when crushed[82, 229]. Plants are untroubled by pests or diseases[160]. Special Features:North American native, Attracts butterflies, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is suckering with suckers sent up away from the trunk from rhizomes, roots, or stolons [1-2]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2]. Form: Rounded, Upright or erect. Flowers are strongly protogynous, self-incompatible and require cross-pollination. However, some trees may be self-compatible; it is an excellent idea to plant two or more

trees for cross-pollination.

## 6.2.44 Smilax china

China Root  
5 tlin 9 cyuc 4 kcaak 0 tcan 3 drwat 4.5 m hkuc  
hmimhtut cyutiit tcup hwicli hrasjlutnyik hpa7tli flatprikliw  
hpa7tmwattli nyanhjen hjonli

drudda Smilax china is a deciduous Climber growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit Leaves RootEdible Uses: Rutin TeaRoot - cooked[4, 105, 177]. Rich in starch[2], the large and fleshy roots can be dried and ground into a powder[11]. The root is harvested by severing larger roots near the crown and leaving the smaller roots to grow on[238]. Young shoots and leaves - raw or cooked[105, 159, 177, 179]. Used as a potherb[183]. The leaves are said to contain rutin, but no details of quantity were given[218]. Fruit - raw. Eaten to quench the thirst[105, 177, 183]. The fruit is about 9mm in diameter[200]. A tea is made from the leaves[177, 179, 183].

tcanta DyeA yellow dye is made from the root and leaves when alum is used as a mordant[4, 178]. With iron sulphate, the colour is brown[4].

dwatta Alterative Antipsoriatic Antiscrophulatic Carmi-native Depurative Diaphoretic Diuretic Skin Tonic Urinary VDThe root is alterative, antiscrophulatic, carminative, depurative, diaphoretic, diuretic and tonic[1, 4, 11, 147, 174, 178, 218]. It is considered useful when taken internally in the treatment of old syphilitic cases and is also used for certain skin diseases, including psoriasis, rheumatoid arthritis, gout, enteritis, urinary tract infections, skin ulcers etc[4, 238]. Large doses can cause nausea and vomiting, which is valuable in weakened and depraved conditions due to a poisoned state of the blood[4]. The root is harvested in the autumn and dried for later use.

propta Seed - sow March in a warm greenhouse[1]. This note probably refers to the tropical members of the genus, seeds of plants from cooler areas seem to require a period of cold stratification, some species taking 2 or more years to germinate[K]. We sow the seed of temperate species in a cold frame as soon as we receive it, and would sow the seed as soon as it is ripe if we could obtain it then[K]. When the seedlings eventually germinate, prick them out into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first year, though we normally grow them on in pots for 2 years. Plant them out into their permanent positions in early summer. Division in early spring as new growth begins[238]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings of half-ripe shoots, July in a frame[238].

nwatta Succeeds in most well-drained soils in sun or semi-shade[200]. Hardy to about -15°C[200]. A climbing plant, supporting itself by means of tendrils and thorns as it scrambles through small trees and shrubs. A young plant is growing and thriving close to a west-facing wall at Kew Botanical gardens[K]. This species is not the true 'China root' of medicine, see the record for *S. pseudo-china*[178]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.45 Prunus angustifolia watsonii

Sand Plum  
5 tlin 9 cyuc 4 kcaak 2 tcan 1 dwat 3 m hkuc  
hmimhtut cyutiit tcup hwicli hrasjlutnyik hpa7tli flatprikliw  
hpa7tmwattli xre7t hjonli

beverages, frozen dairy desserts, candy, baked goods and puddings, with the highest average maximum use level of 0.072% reported for an extract used in baked goods[269].

tcanta Dye Essential Fibre PaperA fine brown dye is obtained from the leaves and flower heads[4, 100, 269]. An essential oil from the female fruiting heads is used in perfumery[213, 238]. Average yields are 0.4 - 0.5%[240]. Extracts of the plant are used in Europe in skin creams and lotions for their alleged skin-softening properties[269]. A fibre is obtained from the stems[46]. Similar to hemp (*Cannabis sativa*)[100] but not as strong[115], it is used to make a coarse kind of cloth[4]. It is sometimes used for filler material in corrugated paper or board products, but is unsuited for corrugated paper because of low pulp yield and high chemical requirement, or for production of high-grade pulp for speciality paper[269]. The fibre is very durable but it is difficult to separate, the stems need to be soaked beforehand for a whole winter[4]. A paper can also be made from the fibre, the stems are harvested in the autumn, the leaves removed and the stems steamed until the fibres can be removed. The fibre is cooked for 2 hours with lye and then hand pounded with mallets or ball milled for 2½ hours. The paper is brown in colour[189].

dwatta Anodyne Antianxiety Antibacterial Antiseptic Antispasmodic Appetizer Diuretic Dysentery Febrifuge Galactogogue Hypnotic Leprosy Nerve Sedative Stomachic TonicHops have a long and proven history of herbal use, where they are employed mainly for their soothing, sedative, tonic and calming effect on the body and the mind. Their strongly bitter flavour largely accounts for their ability to strengthen and stimulate the digestion, increasing gastric and other secretions[254]. The female fruiting body is anodyne, antiseptic, antispasmodic, diuretic, febrifuge, hypnotic, nerve, sedative, stomachic and tonic[4, 9, 21, 46, 165, 192, 218]. Hops are widely used as a folk remedy to treat a wide range of complaints, including boils, bruises, calculus, cancer, cramps, cough, cystitis, debility, delirium, diarrhoea, dyspepsia, fever, fits, hysteria, inflammation, insomnia, jaundice, nerves, neuralgia, rheumatism, and worms[269]. The hairs on the fruits contain lupulin, a sedative and hypnotic drug[213, 218]. When given to nursing mothers, lupulin increases the flow of milk - recent research has shown that it contains a related hormone that could account for this effect[7]. The decoction from the flower is said to remedy swellings and hardness of the uterus[269]. Hop flowers are much used as an infusion or can also be used to stuff pillows where the weight of the head will release the volatile oils[213]. The fruit is also applied externally as a poultice to ulcers, boils, painful swellings etc[4, 218], it is said to remedy painful tumours[269]. The female flowering heads are harvested in the autumn and can be used fresh or dried[238]. Alcoholic extracts of hops in various dosage forms have been used clinically in treating numerous forms of leprosy, pulmonary tuberculosis, and acute bacterial dysentery, with varying degrees of success in China. The female fruiting body contains humulone and lupulone, these are highly bacteriostatic against gram-positive and acid-fast bacteria[240]. A cataplasm of the leaf is said to remedy cold tumours[269]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Humulus lupulus* for nervousness and insomnia (see [302] for critics of commission E).

propta Seed - sow spring in a cold frame[37]. Germination is fairly quick. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out in the summer or following spring. Division in spring as new growth begins[1]. Very easy, you can plant the divisions straight out into their permanent positions if required[K]. Basal cuttings in March. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Ground cover, Screen. Easily grown in a good garden soil in sun or semi-shade[1, 53]. Prefers a deep rich loam[37] and a warm sheltered position[187]. Plants can succeed in dry shade if plenty of humus is incorporated into the soil, once established they are also somewhat drought tolerant[190]. Hops are reported to tolerate an annual precipitation of between 31 and 137cm, an annual temperature in the range of 5.6 to 21.3°C and a pH of 4.5 to 8.2[269]. Plants are very hardy tolerating temperatures down to about -20°C when dormant[187]. The

young shoots in spring, however, can be damaged by any more than a mild frost[269]. A climbing plant, supporting itself by twining around the branches of other plants[219]. Hops are frequently cultivated, both commercially and on a domestic scale, in temperate zones for their seed heads which have many medicinal qualities and are also used as a flavouring and preservative in beer. There are many named varieties[183]. They grow best between the latitudes of 35 - 51°N and 34 - 43°S, with mean summer temperatures of 16 - 18°C[269]. Generally, for beer making, the unfertilized seed heads are preferred and so most male plants are weeded out[4]. Hops are fairly deep rooted, but with a network of shallow feeding roots. These horizontal feeding roots spread out at depth of 20 - 30 cm in the soil and give rise to fibrous roots in upper layers of soil[269]. The vertical roots develop downwards to a depth of about 150 cm with a spread of 183 - 244 cm and have no fibrous roots[269]. The bruised leaves are refreshingly aromatic whilst the flowers cast a pleasing scent[245]. A food plant for many caterpillars[30]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Edible, Invasive, Naturalizing, Attracts butterflies, Suitable for dried flowers, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1). For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.40 Sambucus nigra

Elderberry - European Elder, Black elderberry, American black elderberry, Blue elderberry, Europea  
5 tlin 7 cyuc 4 kcaak 5 tcan 3 drwat 6 m hkuc  
hmimhtut cyutiit tcup hwicli hrasjlutnyikrip hpa7tli flatprikliw  
hpa7tmwattli xre7t hjonli

drudda Sambucus nigra is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from March to November, in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers FruitEdible Uses: Colouring TeaFruit - raw or cooked[2, 3, 5, 46, 61]. The flavour of the raw fruit is not acceptable to many tastes, though when cooked it makes delicious jams, preserves, pies and so forth[K]. It can be used fresh or dried, the dried fruit being less bitter[12, 183, 238]. The fruit is used to add flavour and colour to preserves, jams, pies, sauces, chutneys etc, it is also often used to make wine[13, 183]. The fruit is about 8mm in diameter and is borne in large clusters[200]. Some caution is advised, see the notes above on toxicity. Flowers - raw or cooked[2, 5, 12, 53]. They can also be dried for later use[21]. The flowers are crisp and somewhat juicy, they have an aromatic smell and flavour and are delicious raw as a refreshing snack on a summers day, though look out for the insects[K]. The flowers are used to add a muscatel flavour to stewed fruits, jellies and jams (especially gooseberry jam)[238]. They are often used to make a sparkling wine[183]. A sweet tea is made from the dried flowers[21, 183]. The leaves are used to impart a green colouring to oils and fats[183].

tcanta Compost Cosmetic Dye Fungicide Hedge Hedge

Insecticide Litmus Microscope Musical Pioneer Pipes Repellent WoodThe plant is a valuable addition to the compost heap[14, 18], its flowers are an alternative ingredient of 'QR' herbal compost activator[32] and the roots of the plant improve fermentation of the compost heap when growing nearby[18]. The leaves are used as an insect repellent[4, 6, 14, 66], very effective when rubbed on the skin though they do impart their own unique fragrance[K]. They can be powdered and placed amongst plants to act as a deterrent[14], or made into a spray when they act as an insecticide[7]. This is prepared by boiling 3 - 4 handfuls of leaves in a litre of water; then straining and allowing to cool before applying[201]. Effective against many insects, it also treats various fungal infections such as leaf rot and powdery mildew[201]. The dried flowering shoots are used to repel insects, rodents etc[101]. The flowers are used in skin lotions, oils and ointments[238]. Tolerant of salt-laden gales, this species can be grown as a shelter hedge in exposed maritime areas[29, 75], it is rather bare in the winter though[K]. This is an excellent pioneer species to use when re-establishing woodlands. It is very tough and wind-resistant, grows quickly and provides shelter for longer-lived and taller woodland species to establish. It will generally maintain itself in the developing woodland, though usually in the sunnier positions[K]. A dye is obtained from the fruit and the bark[13, 15]. The bark of older branches and the root have been used as an ingredient in dyeing black[4]. A green dye is obtained from the leaves when alum is used as a mordant[4]. The berries yield various shades of blue and purple dyes[4]. They have also been used as a hair dye, turning the hair black[4]. The blue colouring matter from the fruit can be used as a litmus to test if something is acid or alkaline. It turns green in an alkaline solution and red in an acid solution[4]. The pith in the stems of young branches pushes out easily and the hollow stems thus made have been used as pipes for blowing air into a fire[4]. They can also be made into musical instruments[4]. The pith of the wood is used for making microscope slides and also for treating burns and scalds[46, 61, 100]. The mature wood is white and fine-grained. It is easily cut and polishes well[4]. Valued highly by carpenters, it has many uses, for making skewers, mathematical instruments, toys etc[4, 13, 100, 244]. A good forage for animals: mule deer, elk, sheep and small birds. It is classified as nesting habitat for many birds, including hummingbirds, warblers, and vireos. Elderberries are a favorite food for migrating band-tailed pigeons in northern California.

dwatta Antiinflammatory Aperient Diaphoretic Diuretic Emetic Emollient Expectorant Galactogogue Haemostatic Laxative Ophthalmic Purgative Salve StimulantElder has a very long history of household use as a medicinal herb and is also much used by herbalists[4]. The plant has been called 'the medicine chest of country people'[4]. The flowers are the main part used in modern herbalism, though all parts of the plant have been used at times[238]. Stimulant[9, 53, 165]. The inner bark is collected from young trees in the autumn and is best sun-dried[4]. It is diuretic, a strong purgative and in large doses emetic[4, 7]. It is used in the treatment of constipation and arthritic conditions[238]. An emollient ointment is made from the green inner bark[4]. The leaves can be used both fresh or dry. For drying, they are harvested in periods of fine weather during June and July. The leaves are purgative, but are more nauseous than the bark[4]. They are also diaphoretic, diuretic, expectorant and haemostatic[4, 7]. The juice is said to be a good treatment for inflamed eyes[4]. An ointment made from the leaves is emollient and is used in the treatment of bruises, sprains, chilblains, wounds etc[4]. The fresh flowers are used in the distillation of 'Elder Flower Water'. The flowers can be preserved with salt to make them available for distillation later in the season[4]. The water is mildly astringent and a gentle stimulant. It is mainly used as a vehicle for eye and skin lotions[4]. The dried flowers are diaphoretic, diuretic, expectorant, galactogogue and pectoral[4, 7]. An infusion is very effective in the treatment of chest complaints and is also used to bathe inflamed eyes[4]. The infusion is also a very good spring tonic and blood cleanser[4]. Externally, the flowers are used in poultices to ease pain and abate inflammation[4]. Used as an ointment, it treats chilblains, burns, wounds, scalds etc[4]. The fruit is depurative, weakly diaphoretic and gently laxative[4, 7]. A tea made from the dried berries is said to be a good remedy for colic and diarrhoea[4]. The fruit is widely used for making wines, preserves etc., and these are said

to retain the medicinal properties of the fruit[4]. The pith of young stems is used in treating burns and scalds[46, 61, 100]. The root is no longer used in herbal medicine but it formerly had a high reputation as an emetic and purgative that was very effective against dropsy[4]. A homeopathic remedy is made from the fresh inner bark of young branches[4]. It relieves asthmatic symptoms and spurious croup in children[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Sambucus nigra* for cough and bronchitis, fevers and colds (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78]. Division of suckers in the dormant season.

nwatta Industrial Crop: Dye Industrial Crop: Medicinal Management: Standard Minor Global CropLandscape Uses:Border, Container, Massing, Pollard, Standard, Seashore, Specimen. A very easily grown plant, it tolerates most soils and situations[11, 28, 98], growing well on chalk[28, 98, 186], but prefers a moist loamy soil[200]. Grows well in heavy clay soils. Tolerates some shade but fruits better in a sunny position[37, 200]. Tolerates atmospheric pollution and coastal situations[200]. Another report says that it is intolerant of very smoky atmospheres[186]. The elder is very occasionally cultivated for its edible fruit, there are some named varieties though most of these have been developed for their ornamental value[182]. The subspecies *S. nigra alba* has white/green fruits that are nicer than the type species and are quite nice raw[K]. The elder also has a very long history of folk use, both medicinally and for a wide range of other uses. All in all it is a very valuable plant to have in the garden. The leaves often begin to open as early as January and are fully open in April[186]. The leaves fall in October/November in exposed sites, later in sheltered positions[186]. Young stems can be killed by late frosts but they are soon replaced from the ground level[186]. Very tolerant of pruning, plants can be cut back to ground level and will regrow from the base[186]. The flowers have a sweet, almost overpowering smell, not exactly pleasant when inhaled near to for it has fishy undertones, but from a distance its musky scent is appealing[245]. Very resistant to the predations of rabbits[17, 186]. The flowers are very attractive to insects[186]. The fruit is very attractive to birds[186] and this can draw them away from other cultivated fruits[14, 186]. The elder is an early colonizer of derelict land, the seed arriving in the defecations of birds and mammals[186]. It is a very good pioneer species for re-establishing woodlands. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Not North American native, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 6.2.41 Phyllostachys aureosulcata

Yellow-Groove Bamboo

5 tlin 11 cyuc 4 kcaak 2 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys aureosulcata is an evergreen Bamboo growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Shoots StemEdible Uses: Young shoots - raw or cooked. They have very little bitterness, even when eaten raw[183, 195]. The canes of plants grown in Britain are about 25mm in diameter[K], though they can reach up to 4cm in diameter[266]. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level. Young culms are green with yellow grooves.

tcanta Plant support WoodThe canes are not of the best quality but make good plant supports[195]. A good screen plant.

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position. One report says that this is a very hardy plant, withstanding temperatures down to about -20°C, whilst another says that it dislikes prolonged exposure to hard frosts[200]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. The rootstock is running but only slightly so in the cooler climate of Britain. In warmer climates (e.g. US South West) it can spread indefinitely if not confined with an underground barrier. The bottoms of some culms have large kinks in them, this limits their use for timber etc but makes them more ornamental. Heat zone: 12-3.

## 6.2.42 Crataegus champlainensis

Quebec hawthorn

5 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 6 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Crataegus champlainensis* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A nice sweet flavour, the fruit is about 1.5cm in diameter[K]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use.

The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. Closely related to *C. submollis*[200], and included in that species by some botanists[82]. This species is possibly no more than a part of *C. rotundifolia*[204].

## 6.2.43 Asimina triloba

Papaw

5 tlin 8 cyuc 4 kcaak 3 tcan 2 dwat 4.5 m hkuc hmimhtut cyutli tcup hwicli jlut hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta *Asimina triloba* is a deciduous Shrub growing to 4.5 m (14ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from May to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[2, 3, 11, 46, 62, 99]. A very good size, it can be up to 16cm long and 4cm wide[82, 200]. Of variable quality, some forms (with orange skins) are exquisite with the flavour of banana custard whilst others (with yellow, white or dark brown skins) can be unpleasant[57, 85, 183]. Another report says that the white fruits are mildly flavoured and later ripening than the orange fruits[227]. The fruit can also be used for making preserves, pies, ice cream and other sweet desserts[183]. The fruit falls from the tree in autumn and is then stored until fully ripe[227]. The fruit can cause gastrointestinal upsets for some people[274].

tcanta Dye Fibre Insecticide Parasiticide WoodA fibre from the inner bark is used for making strong rope and



are common ingredients in remedies for colds and coughs, either taken internally or used as an inhalant[238]. The leaves and/or the resin are used in folk medicine to treat bronchitis, cystitis, leucorrhoea, ulcers and flatulent colic[268]. The resin is also used externally in bath extracts, rubbing oils etc for treating rheumatic pains and neuralgia[238]. Oil of Turpentine, which is obtained from the trunk of the tree, is occasionally used instead of the leaves or the resin. The oil is also rubeeficant and can be applied externally in the treatment of neuralgia[268].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Landscape Uses:Screen, Specimen. Prefers a good moist but not water-logged soil[1] though it tolerates most soils except infertile sands and peats[11, 81]. Grows well in heavy clay soils. Prefers a slightly acid soil, with a pH down to about 5, and a north-facing slope[200]. Plants are very shade tolerant and this species has often been used to underplant in forests[11, 81], but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Requires a generous rainfall and a sheltered position[11, 81]. Intolerant of windy sites[81]. The silver fir is a very hardy plant when dormant but it comes into growth in April and is then susceptible to damage by late frosts and aphids[185, 238]. This species is particularly subject to aphid infestation in many parts of the country[11], and is also prone to dieback and rust caused by fungal infections[238]. Trees are slow growing for the first few years but from the age of around 6 years growth accelerates and height increases of 1 metre a year are not uncommon[185]. Grows best in moist valleys in Scotland[11] and in S.W. England where it often self-sows. This species also thrives in E. Anglia[17]. Another report says that this species is not happy in the hot, dry, Lower Thames Valley, and does not thrive in many low-lying and frosty parts of southern England[11]. It has been planted as a timber tree in northern and western Europe[50]. It is also commonly used as a 'Christmas tree'[61, 200]. This tree is notably resistant to honey fungus[11, 81, 200]. Trees should be planted into their permanent positions when they are quite small, preferably between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Unlike most species of conifers, this tree can be coppiced and will regenerate from the stump[126]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cultivar 'Pendula' used to be widely planted for ornament, shelter and timber but because it is now susceptible to damage by *Adelges nordmannianae* it is seldom planted. Research is going on (1975) to find provenances that are resistant[185]. Special Features:Not North American native, There are no flowers or blooms.

## 6.2.240 Quercus petraea

Sessile Oak, Durmast oak

5 tlin 8 cyuc 2 kcaak 0 tcan 3 dwat 40 m hkuc hmimhtut cyutli tucpaha7n hwicli jutnyukfrip hpa7tli frusflatprkwihs hpa7tmwatli hjonli

drutta Quercus petraea is a deciduous Tree growing to 40 m (131ft) by 25 m (82ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kckahta Edible Parts: SeedEdible Uses: Coffee GumSeed - cooked[2, 5, 8, 13]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method would be to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[21, 61]. An edible gum is obtained from the bark[177].

tcanta Basketry Charcoal Compost Fuel Gum Ink Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20, 201]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The bark is an ingredient of 'Quick Return' herbal compost activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The bark is very rich in calcium[13]. An ink is made from the oak galls, mixed with salts of iron[7, 66]. The wood is a source of tar, quaiacol, acetic acid, creosote and tannin[123]. Tannin is extracted commercially from the bark and is also found in the leaves[223]. Wood - hard, tough, durable even under water. It is highly valued for furniture, construction etc[4, 13, 66]. It is also a good fuel and charcoal[6, 61]. Trees can be coppiced to provide material for basket making, fuel, construction etc[23].

dwatta Antiseptic Astringent Bach Decongestant Dysentery Haemostatic TonicThe oak tree has a long history of medicinal use. It is anti-inflammatory, antiseptic, astringent, decongestant, haemostatic and tonic[4, 7, 9, 13, 21, 165]. The bark is the part of the plant that is most commonly used[4], though other parts such as the galls, seeds and seed cups are also sometimes used[7]. A decoction of the bark is useful in the treatment of chronic diarrhoea, dysentery, intermittent fevers, haemorrhages etc[4]. Externally, it is used to bathe wounds, skin eruptions, sweaty feet, piles etc[9]. It is also used as a vaginal douche for genital inflammations and discharge, and also as a wash for throat and mouth infections[9]. The bark is harvested from branches 5 - 12 years old, and is dried for later use[9]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Despondency', 'Despair', but never ceasing effort'[209]. A homeopathic remedy is made from the bark. It is used in the treatment of disorders of the spleen and gall bladder[9].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cold overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[11]. Dislikes heavy clay[98]. Young plants tolerate reasonable levels of side shade[200]. Found mainly on acid soils in the wild. Thrives in well drained soils but is also tolerant of periodic flooding[186]. Tolerates exposure and strong winds if these are not salt-laden[186]. A very important timber tree

that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.103 Tilia japonica

Japanese Lime

5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyuk hpa7tli flatprkwihs hpa7tmwatli xre7t hjonli

drutta Tilia japonica is a deciduous Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckahta Edible Parts: Flowers Fruit LeavesEdible Uses: TeaYoung leaves - raw or cooked[105, 177]. Flowers - parboiled to remove the bitterness and used as greens or added to soups[183]. A tea is made from the flowers[177, 183]. Fruit[105, 183]. No further details are given. This report possibly refers to the fact that the seed and flowers of some species can be made into a chocolate substitute. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta Fibre WoodA fibre is obtained from the inner bark and used for sandals, cordage etc[46, 61, 189]. Wood - light, soft. Used for boxes, barrels etc[46, 61].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. The leaves appear early in the spring and are not troubled by frosts. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Cultivated for its wood in Japan[125]. A very good seed plant[125]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.104 Carya cathayensis

Chinese Hickory

5 tlin 9 cyuc 3 kcaak 3 tcan 0 dwat 18 m hkuc

htut cyutli tcup hwicli hrasljutnyuk hpa7tli flatprkwihs hpa7tmwatli fyif hjonli

drutta Carya cathayensis is a deciduous Tree growing to 18 m (59ft 1in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kckahta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[46, 61, 105, 109]. Rich in oil[266]. It has a sweet flavour and is highly esteemed by the Chinese[137]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K]. An edible oil from the seed is used in cooking[109]. Carbon Farming - Staple Crop: oil.

tcanta Fuel Fuel Oil Wood WoodWood - hard, tough, elastic. Used for tool handles etc[46, 61, 109]. A very good fuel, burning well and giving off a lot of heat.

dwatta None known

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh pot fitted to keep the mice out is ideal)

nwatta Management: Standard Regional Crop Staple Crop: OilPrefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. Dislikes wind exposure[109]. Plants are intolerant of much frost[109]. Another report says that plants succeeds in climatic zone 6, which suggests that they should tolerate temperatures down to about -15 and -20°C[200]. Cultivated for fod in China[266], the edible seed is often sold in local markets in China[137]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229]. Carbon Farming - Cultivation: regional crop only. Management: standard.

## 6.2.105 Castanea ozarkensis

Ozark Chinkapin

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 18 m hkuc hmimhtut cyutli hgtakycuctcup hwicli hyshrasljutnyuk hpa7tli frusflatprk hpa7tmwatli hjonli

drutta Castanea ozarkensis is a deciduous Tree growing to 18 m (59ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light

(sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 117, 177]. Small but tasty[183]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K].

tcanta TanninThe bark, leaves, wood and seed husks all contain tannin.

dwatta None known

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Prefers a good well-drained slightly acid loam but it also succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Although it is winter-hardy in most parts of Britain, this species only really thrives in areas with hot summers[200]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.106 Tilia tuan

5 tlin 9 cyuc 3 kcak 0 tcan 1 dwat 16 m hkuc hmimhmtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli sre7t hjonli

drutta Tilia tuan is a deciduous Tree growing to 16 m (52ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw. The dried flowers make a refreshing herb tea. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta Fibre WoodA fibre is obtained from the inner bark and is used in making sandals and cordage[46, 61, 189]. Wood[46]. No more details.

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°c at night, up to 30°c by day) and then 5 months cold stratification[80]. When they are large

enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. A good bee plant[125]. Unlike most other members of this genus, this species does not usually become infested with aphis[125]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.107 Taxus baccata

Yew, English yew, Common Yew

5 tlin 7 cyuc 3 kcak 4 tcan 4 dwat 15 m hkuc

pcimhmimhtut cyutli hqatkyuctcup hwicli hrasjlutnyikfrip hpa7tli frusflatprikwisslip hpa7tmwatli nyanhjen hjonli

drutta Taxus baccata is an evergreen Tree growing to 15 m (49ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from March to April, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw[1, 2, 65, 81, 158]. Very sweet and gelatinous, most people find it delicious though some find it sickly[K]. A number of people who like the flavour do not like the texture which is often described as being ‘snotty’[K]. All other parts of this plant, including the seed, are highly poisonous. When eating the fruit you should spit out the large seed found in the fruit’s centre. Should you swallow the whole seed it will just pass straight through you without harm (UPDATE: this is probably not true: unfortunately, the digestive system of most mammals, including humans, is robust enough to break down the seeds. This will release the toxic taxanes. Birds are able to eat the whole “berry” because they cannot digest the seeds). If it is bitten into, however, you will notice a very bitter flavour and the seed should immediately be spat out or it could cause some problems. The fruit is a fleshy berry about 10mm in diameter and containing a single seed[200]. Some reports suggest using the bark as a tea substitute[158, 183], this would probably be very unwise.

tcanta Fuel Hedge Hedge Insective WoodVery tolerant of trimming, this plant makes an excellent hedge[1, 11, 29]. The plants are often used in topiary and even when fairly old, the trees can be cut back into old wood and will re-sprout[200]. One report says that trees up to 1000 years old respond well to trimming[200]. A decoction of the leaves is used as an insecticide[46, 61]. Some cultivars can be grown as a ground cover when planted about 1 metre or more apart each way[208]. ‘Repandens’ has been recommended[208]. Wood - heavy, hard, durable, elastic, takes a good polish but requires long seasoning. Highly esteemed by cabinet makers, it is also used for bows, tool handles etc[4, 7, 11, 46, 61,

Lam. is the cos lettuce. This has longer, thinner leaves and a more erect habit, it does not form a compact heart. Lettuces are quite a problematic crop to grow. They require quite a lot of attention to protect them from pests such as slugs, aphids and birds. If the weather is hot and dry the plants tend to run very quickly to seed, developing a bitter flavour as they do so. In wet weather they are likely to develop fungal diseases. In addition, the seed needs to be sown at regular intervals of 2- 3 weeks during the growing season in order to provide a regular supply of leaves. Lettuces make a good companion plant for strawberries, carrots, radishes and onions[18, 20, 201]. They also grow well with cucumbers, cabbages and beetroot[201].

## 6.2.238 Abies grandis

Grand Fir, Giant Fir, Lowland White Fir
5 tlin 6 cyuc 2 kcak 0 tcan 2 dwat 75 m hkuc pcimhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flat-prik hpa7tmwatli hjonli

drutta Abies grandis is an evergreen Tree growing to 75 m (246ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: Drink Gum Tealnner bark - cooked. It is usually dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[161]. It is best used in the spring when it is rich and juicy[213]. An emergency food, it is only used when all else fails[183]. The gum from the trunk is hardened (probably in cold water[K]) and used as a chewing gum[257]. It can also be made into a drink[257]. Young shoot tips are used as a tea substitute[183, 257].

tcanta Baby care Dye Gum Incense Repellent Roofing WoodThe aromatic leaves are used as a moth repellent[169]. The boughs have been used in the home as an incense[257]. A pink dye can be obtained from the bark[226]. The dried and hardened pitch can be chewed as a tooth cleanser[257]. A powder made from the dried and crushed leaves was used as a baby powder by the N. American Indians[226]. The bark can be used as a waterproof covering material for buildings and canoes[257]. Wood - light, soft, coarse grained, not strong, not very durable. Used for interior work, cases, etc[46, 61, 82]. Of little value as a lumber, it is used mainly for pulp and fuel[229, 257].

dwatta Antirheumatic Laxative Ophthalmic Skin Stomachic TB TonicA gum that exudes from the bark is used externally as an ointment[245]. It has also been used as a wash for sore and infected eyes and as a gargle for sore throats[257]. A decoction is laxative and tonic, it is used to treat stomach problems[257]. Externally, the gum is applied as a poultice to cuts and sores[257]. A decoction of the root bark or stem is used in the treatment of stomach problems and TB[257]. A poultice is applied to joints to ease rheumatism or to the chest to treat lung haemorrhages[257]. A decoction of the leaves is used as a tonic and in the treatment of colds[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Landscape Uses:Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils and succeeds in poor sandy soils[185]. Very shade tolerant, especially when young, but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Trees succeeds in very exposed positions, even if the top is blown out by the wind the trees make one or more new tops and continue growing with no loss of vigour[11, 185]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. This species thrives exceedingly well in the moister parts of Britain, where it grows very quickly[11]. It is cultivated for timber in W. and N. Europe[50]. Trees are slow growing for the first few years but they are then quite fast with trees growing 60 - 100cm in height and 8cm in girth per year even when they are quite large[1, 185]. New growth takes place from early May to July[185]. Trees grow best in the Perthshire valleys of Scotland and in the far west of Britain[11]. Some trees have reached heights in excess of 60 metres in 100 years in Wales and Scotland, making them amongst the tallest trees in Europe[200]. A very ornamental plant[1], it is rarely harmed by disease, insects or frost[1]. The crushed leaves have a fruity orange-flavoured aroma[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Special Features:North American native, There are no flowers or blooms.

## 6.2.239 Abies alba

Silver Fir, Christmas Tree Fir, European Silver Fir, Silver
5 tlin 8 cyuc 2 kcak 4 tcan 3 dwat 45 m hkuc pcimhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flat-prik hpa7tmwatli hjonli

drutta Abies alba is an evergreen Tree growing to 45 m (147ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: Inner bark - cooked. It is dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[105, 177].

tcanta Essential Lacquer Paint Resin Tannin WoodAn oleo-resin is obtained from blister-like swellings in the bark[64, 100]. It is harvested in the summer and used fresh, dried or distilled for oil[238]. The resin extracted from it is used in perfumery, medicine and for caulking ships[46, 61, 64, 100]. It is called ‘Strasburg Turpentine’[46]. Oil of turpentine is an important solvent in the paint industry[238]. The residue, known as ‘rosin oil’, is used in making varnishes, lacquers and carbon black (for pigments and ink)[238]. Resin is tapped from trees about 60 - 80 years old in the spring and used for the distillation of oil[238]. An essential oil obtained from the leaves is used as a disinfectant and also in medicine and perfumery[46, 61]. It is a common ingredient in many bath products, giving them their familiar pine scent[7]. The bark is a source of tannin[7]. Wood - light, soft, durable, elastic. The timber of this tree is especially sought after for its lightness, it is used for construction, furniture, boxes, pulp etc[7, 46, 61, 89, 101].

dwatta Antibiotic Antirheumatic Antiseptic Astringent Balsamic Diuretic Expectorant Vasoconstrictor VulneraryThe buds are antibiotic, antiseptic and balsamic[7]. The bark is antiseptic and astringent[7]. It can be harvested as required throughout the year[238]. The leaves are expectorant and a bronchial sedative[7]. They are best harvested in the spring and can be dried for later use[238]. The resin is antiseptic, balsamic, diuretic, eupetic, expectorant, vasoconstrictor and vulnerary[7]. Both the leaves and the resin

## 6.2.236 Apium graveolens

Wild Celery. Ajmod, Ajwain-ka-patta (Indian)  
5 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliwshom  
hpa7tmwatli fyfxre7t hjonli

drutta Apium graveolens is a BIENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: CondimentLeaves - raw or cooked[52, 105]. Mainly used as a flavouring in soups etc[5, 7, 9, 46]. They can be eaten raw but have a very strong flavour[52]. They are toxic if consumed in large amounts[238]. Seed - a flavouring. Used in small quantities to flavour soups and stews[238]. An essential oil from the seed is also used as a flavouring[46, 105]. Root - cooked[74].

tcanta EssentialThe growing plant is an insect repellent, it repels the cabbage white butterfly so is a good companion for brassicas[20].

dwatta Antianxiety Antirheumatic Aperient Appetizer Carminative Diuretic Emmenagogue Galactogogue Nervine Stimulant TonicWild celery has a long history of medicinal and food use. It is an aromatic bitter tonic herb that reduces blood pressure, relieves indigestion, stimulates the uterus and is anti-inflammatory[238]. The ripe seeds, herb and root are aperient, carminative, diuretic, emmenagogue, galactogogue, nervine, stimulant and tonic[4, 7, 21, 165]. Wild celery is said to be useful in cases of hysteria, promoting restfulness and sleep and diffusing through the system a mild sustaining influence[4]. The herb should not be prescribed for pregnant women[238]. Seeds purchased for cultivation purposes are often dressed with a fungicide, they should not be used for medicinal purposes[238]. The root is harvested in the autumn and can be used fresh or dried[238]. The whole plant is harvested when fruiting and is usually liqui-dized to extract the juice[238]. The seeds are harvested as they ripen and are dried for later use[238]. An essential oil obtained from the plant has a calming effect on the central nervous system. Some of its constituents have antispasmodic, sedative and anticonvulsant actions. It has been shown to be of value in treating high blood pressure[254]. A homeopathic remedy is made from the herb[9]. It is used in treating rheumatism and kidney complaints[9].

propta Seed - sow spring or autumn in situ. If seed is in short supply it can be sown in a cold frame in spring. The seed can harbour certain diseases of celery, it is usually treated by seed companies before being sold but if you save your own seed you should make sure that only seed from healthy plants is used[1].

nwatta Prefers a rich moist soil in sun or semi-shade[238], but with some shade in the summer[52]. It is tolerant of saline soils[238]. The plants are fairly hardy, though they can be damaged by hard frosts[238]. Wild celery is the parent of the cultivated celery (*A. graveolens dulce*) as well as celery leaf (*A. graveolens secalinum*) and celeriac (*A. graveolens rapaceum*). This entry only deals with the wild celery, the other plants are dealt with separately. A very aromatic plant, the aroma being most noticeable when the foliage is bruised. The growing plant is a good companion for leeks, tomatoes, French beans and brassicas[18].

## 6.2.237 Lactuca sativa

Lettuce, Garden lettuce  
5 tlin 9 cyuc 3 kcaak 1 tcan 3 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli prikliwis  
hpa7tmwatli fyfxre7t hjonli

drutta Lactuca sativa is a ANNUAL/BIENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is

self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Oil- Leaves - raw or cooked[7, 37]. A mild slightly sweet flavour with a crisp texture, lettuce is a very commonly used salad leaf and can also be cooked as a potherb or be added to soups etc[183]. A nutritional analysis is available[218]. Seed - sprouted and used in salads or sandwiches[183]. An edible oil is obtained from the seed[7]. The seed is very small, extraction of the oil on any scale would not be very feasible[K].

tcanta Hair Oil Parasiticide ParasiticideParasiticide[178]. No further details are given, but it is probably the sap of flowering plants that is used. The seed is said to be used to make hair grow on scar tissue[218].

dwatta Anaphrodisiac Anodyne Antispasmodic Carminative Diuretic Emollient Expectorant Febrifuge Galactogogue Hypnotic Hypoglycaemic Narcotic Parasiticide Parasiticide SedativeThe whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. The cultivated lettuce does not contain as much lactucarium as the wild species, most being produced when the plant is in flower[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. The seed is anodyne and galactogogue[218]. Lettuce has acquired a folk reputation as an anaphrodisiac, anodyne, carminative, diuretic, emollient, febrifuge, hypoglycaemic, hypnotic, narcotic, parasiticide and sedative[218].

propta Seed - sow a small quantity of seed in situ every 2 or 3 weeks from March (with protection in cooler areas) to June and make another sowing in August/September for a winter/spring crop. Only just cover the seed. Germination is usually rapid and good, thin the plants if necessary, these thinnings can be transplanted to produce a slightly later crop (but they will need to be well watered in dry weather). More certain winter crops can be obtained by sowing in a frame in September/October and again in January/February.

nwatta Prefers a light sandy loam[1]. Succeeds in most well-drained, humus-rich soils but dislikes acid conditions[1, 16]. Plants strongly dislike dry conditions, quickly running to seed in such a situation. Early and late sowings are best in a sunny position, but summer crops are best given a position with some shade in order to slow down the plants tendency to go to seed and to prevent the leaves becoming bitter[18, 20]. The garden lettuce is widely cultivated in many parts of the world for its edible leaves and is probably the most commonly grown salad plant. There are many named varieties[183] capable of providing fresh leaves throughout the year if winter protection is given in temperate areas. Over the centuries a number of more or less distinct forms have arisen in cultivation. These forms have been classified as follows. They are treated separately in more detail:- *L. sativa angustana*. L.H.Bailey. is the Celtsuce. The leaves of this form are not of such good quality as the other lettuces and the plant is grown more for its thick central stem which is used in the same ways as celery[1]. *L. sativa capitata*. *L.* is the heading lettuce, it forms a heart in a similar way to cabbages. Examples of this include the Iceberg and Butterhead lettuces. *L. sativa crispa*. *L.* is the curled or leaf lettuce. This does not form a central heart but produces a loose rosette of basal leaves. It can be harvested on a cut and come again basis. *L. sativa longifolia*

66, 146]. It makes a good firewood[6]. The wood is burnt as an incense[146].

dwatta Anticonvulsant Antispasmodic Cancer Car-diotonic Diaphoretic Emmenagogue Epilepsy Expectorant Homeopathy Narcotic PurgativeThe yew tree is a highly toxic plant that has occasionally been used medicinally, mainly in the treatment of chest complaints. Modern research has shown that the plants contain the substance 'taxol' in their shoots. Taxol has shown exciting potential as an anti-cancer drug, particularly in the treatment of ovarian cancers[238]. Unfortunately, the concentrations of taxol in this species are too low to be of much value commercially, though it is being used for research purposes[238]. This remedy should be used with great caution and only under the supervision of a qualified practitioner[21]. See also the notes above on toxicity. All parts of the plant, except the fleshy fruit, are antispasmodic, cardiotoxic, diaphoretic, emmenagogue, expectorant, narcotic and purgative[7, 21]. The leaves have been used internally in the treatment of asthma, bronchitis, hiccup, indigestion, rheumatism and epilepsy[240, 257]. Externally, the leaves have been used in a steam bath as a treatment for rheumatism[257]. A homeopathic remedy is made from the young shoots and the berries[4]. It is used in the treatment of many diseases including cystitis, eruptions, headaches, heart and kidney problems, rheumatism etc[4]. Ingestion of 50-100g of needles can cause death.

propta Seed - can be very slow to germinate, often taking 2 or more years[78, 80]. It is best sown as soon as it is ripe in the autumn when it should germinate 18 months later. Stored seed may take 2 years or more to germinate, 4 months warm followed by 4 months cold stratification may help reduce the germination time[113]. Harvesting the seed 'green' (when fully developed but before it has dried on the plant) and then sowing it immediately has not been found to reduce the germination time because the inhibiting factors develop too early[80]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in pots in a cold frame. The seedlings are very slow-growing and will probably require at least 2 years of pot cultivation before being large enough to plant out. Any planting out is best done in late spring or early summer, after the last expected frosts[K]. Cuttings of half-ripe terminal shoots, 5 - 8cm long, July/August in a shaded frame. Should root by late September but leave them in the frame over winter and plant out in late spring[78]. High percentage[11]. Cuttings of ripe terminal shoots, taken in winter after a hard frost, in a shaded frame[113].

nwatta Industrial Crop: Medicinal Management: Cop-pice Regional CropLandscape Uses:Espalier, Firewood, Hedge, Screen, Standard, Superior hedge, Specimen. A very easy plant to grow, it is extremely tolerant of cold and heat, sunny and shady positions, wet and dry soils, exposure and any pH[200]. Thrives in almost any soil, acid or alkaline, as long as it is well-drained[1, 11, 200]. Grows well in heavy clay soils. Sensitive to soil compaction by roads etc[186, 200]. Very shade tolerant[17, 81]. Tolerates urban pollution[200]. In general they are very tolerant of exposure, though plants are damaged by severe maritime exposure[K]. A very cold hardy plant when dormant, tolerating temperatures down to about -25°C[200]. The fresh young shoots in spring, however, can be damaged by frosts[186, K]. Plants are dioecious, though they sometimes change sex and monoecious trees are sometimes found[81, 186]. Male and female trees must be grown if fruit and seed is required[K]. The fruit is produced mainly on the undersides of one-year old branches[200]. A very long lived tree[1, 7, 11, 185], one report suggests that a tree in Perthshire is 1500 years old, making it the oldest plant in Britain. Another report says that trees can be up to 4000 years old[11]. It is, however, slow growing and usually takes about 20 years to reach a height of 4.5 metres[186]. Young plants occasionally grow 30cm in a year but this soon tails off and virtually no height increase is made after 100 years[185]. A very ornamental tree, there are many named varieties[200]. Very resistant to honey fungus[8, 88, 200], but susceptible to phytophthora root rot[81, 88]. The bark is very soft and branches or even the whole tree can be killed if the bark is removed by constant friction such as by children climbing the tree[186]. Plants produce very little fibrous root and should be planted in their final positions when still small[200]. The fruit is greatly relished by thrushes[186]. Special Features: Not North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms.

## 6.2.108 Crataegus cuneata

Sanzashi, Chinese hawthorn  
5 tlin 9 cyuc 3 kcaak 3 tcan 3 dwat 15 m hkuc  
hmimhtut cyutli hgactcuphja7n hwicli hrasjlutnykvikfrip hpa7tli  
flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus cuneata is a deciduous Shrub growing to 15 m (49ft 3in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked and used in pies, preserves etc[147, 183]. It can also be dried for later use[177, 183]. A pleasant flavour, it is sold in local markets in China and Japan[178]. The fruit contains about 0.44% protein, 1% fat, 22.1% carbohydrate, 0.8% ash, it is rich in vitamin C, fruit acids and pectin[179]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Anodyne Anticholesterolemic Astringent Blood tonic Cardiotonic Dysentery Haemostatic Hypotensive Stom-achic Vitamin CThe fruits and flowers of hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222]. The fruit is anodyne, anticholesterolemic, antiarrhythmic, antidiarrhetic, antidiarrhetic, astringent, blood tonic, cardiotoxic, haemostatic and stomachic[61, 147, 176, 218]. It is used in the treatment of dyspepsia, stagnation of fatty food, abdominal fullness, retention of lochia, amenorrhoea, postpartum abdominal pain, hypertension and coronary heart disease[176].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Although perfectly cold-hardy in most of Britain when dormant, the young growth of this species might be susceptible to spring frosts[11]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though

grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 6.2.109 Taxus brevifolia

Pacific Yew

5 tlin 9 cyuc 3 kcak 3 tcan 4 dwat 15 m hkuc  
pcimhmimhtu cyutli kyucup hwichi hrsajlutnyik hpa7tli frusflatpriklwisslip hpa7tmwatli hwnhjen hjonli

drutta Taxus brevifolia is an evergreen Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from March to May, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 161, 257]. Very sweet and gelatinous, most people find it delicious though some find it sickly[K]. The fruit is a fleshy berry about 8mm in diameter and containing a single seed[200]. Trees usually produce good crops every year[229]. All other parts of this plant, including the seed, are highly poisonous. When eating the fruit you should spit out the large seed found in the fruit's centre. Should you swallow the whole seed it will just pass straight through you without harm, if the seed has been bitten into, however, it could cause some problems.

tcanta Paint WoodA red paint was made by mixing the woodchips with oil[226]. The roots have been used as the weft in twined basketry[257]. The root is very strong and is particularly good for hopper mortar baskets[257]. Wood-fine-grained, strong, hard, heavy, durable and resilient, taking a very fine polish. Though hard, the wood is easy to carve[226]. It is also used for making paddles, fence posts and various other small articles[46, 61, 82, 226, 229, 257].

dwatta Cancer Diaphoretic Pectoral PoulticeThe Pacific yew is a highly toxic plant but it was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. Modern research has shown that it contains the substance 'taxol' in its shoots and bark. Taxol has shown exciting potential as an anti-cancer drug, particularly in the treatment of ovarian cancers[238]. Unfortunately, the concentrations of taxol are rather low and the bark of 6 trees is required to provide enough taxol to treat one patient[238]. This remedy is very toxic and, even when used externally, should only be used under the supervision of a qualified practitioner[238]. See also the notes above on toxicity. All parts of the plant, except the fleshy fruit, are diaphoretic and pectoral[257]. A decoction of the branches and leaves has been used in the treatment of lung problems[257]. An infusion of the crushed leaves has been used externally as a wash to cause perspiration and effect a general improvement in the health[257]. A poultice of the crushed leaves has been applied to wounds[257]. A decoction of small woody pieces has been used in the treatment of internal complaints including stomach pains and blood in the urine[257]. The leaves are harvested in early autumn or spring, the bark from autumn to spring, for commercial extraction of taxol[238]. Ingestion of 50-100g of needles can cause death.

propta Seed - can be very slow to germinate, often taking 2 or more years[78, 80]. It is best sown as soon as it is ripe in the autumn when it should germinate 18 months later. Stored seed may take 2 years or more to germinate. 4 months warm followed by 4 months cold stratification may help reduce the germination time[113]. Harvesting the seed 'green' (when fully developed but before it has dried on the plant) and then sowing it immediately has not been found to reduce the germination time because the inhibiting factors

develop too early[80]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in pots in a cold frame. The seedlings are very slow-growing and will probably require at least 2 years of pot cultivation before being large enough to plant out. Any planting out is best done in late spring or early summer, after the last expected frosts[K]. Cuttings of half-ripe terminal shoots, 5 - 8cm long, July/August in a shaded frame. Should root by late September but leave them in the frame over winter and plant out in late spring[78]. High percentage[11]. Cuttings of ripe terminal shoots, taken in winter after a hard frost, in a shaded frame[113].

nwatta Management: Coppice Regional CropThrives in almost any soil, acid or alkaline, as long as it is well-drained[1, 200]. Succeeds in dry soils. Plants are very shade tolerant[81]. Dormant plants are very cold-hardy, though the young growth in spring can be damaged by late frosts. A slow-growing but apparently long-lived tree[229]. Plants produce very little fibrous root and should be planted in their final positions when still small[200]. Because of its useful wood, large trees are unscrupulously poached from the wild and, in some areas, the species has been nearly extirpated. Exploitation of the species for medicinal purposes is further threatening it in the wild[270]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.110 Tilia oliveri

5 tlin 9 cyuc 3 kcak 0 tcan 1 dwat 15 m hkuc  
hmimhtu cyutli tcup hwichi hrsajlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Tilia oliveri is a deciduous Tree growing to 15 m (49ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw or cooked[179]. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

tcanta FibreA fibre is obtained from the tough inner bark It can be made into diverse items such as mats, shoes and coarse cloth[229].

dwatta Antispasmodic Diaphoretic SedativeA tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

propta Seed - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

nwatta Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soils[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188] Prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[2]. The bulbs are eaten by the N. American Indians[183]. They are rather small, about 4cm tall and 15mm wide[235]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta A sweetened decoction of the root has been taken, mainly by children, as a remedy for colds[257]. Although no other specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Landscape Uses:Border, Container, Massing, Rock garden. An easily grown plant, it prefers a sunny position in a rich moist but well-drained soil[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. There is at least one named variety - 'Album' has white flowers[200]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Closely allied to A. cernuum and to A. textile[1]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: North American native, Suitable for cut flowers.

## 6.2.233 Osmorhiza chilensis

5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 0.8 m hkuc  
hmimhtu cyutli tcup hwichi hrsajlutnyik hpa7tli flatpriklwis hpa7tmwatli fyixre7t hjonli

drutta Osmorhiza chilensis is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. kcakta Edible Parts: RootEdible Uses: Root - raw or cooked. It is considered to be a delicacy[69].

tcanta None known

dwatta None known

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise sow it in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in any deep moisture-retentive soil in sun or dappled shade[200]. Plants are hardy to about -20°C[200]. Well suited to naturalistic plantings in a woodland or wild garden[200]. A sweetly aromatic plant[200].

## 6.2.234 Gaultheria ovatifolia

Mountain Checkerberry, Western teaberry

5 tlin 9 cyuc 3 kcak 3 tcan 0 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwichi hrsajlutnyik hpa7tli frusflatpriklwis hpa7tmwatli xre7t hjonli

drutta Gaultheria ovatifolia is an evergreen Shrub growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to

August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 62, 183]. Spicy and delicious[11]. The fruit is up to 6mm in diameter[200].

tcanta A useful ground cover for shady places.

dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood, 7cm with a heel, July/August in a shady frame. Rather slow, it usually takes 12 months for the roots to form[78]. Division in early spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Layering in September/October. Takes 12 months.

nwatta Prefers a moist but not boggy humus rich soil in shade or semi-shade[11, 182]. This species prefers considerable shade[1]. A peat and moisture loving species, requires a lime-free soil[11, 182]. Closely related to G. humifusa[182]. Reputed to be rather difficult in cultivation[11], it does not grow well in S. England[1]. The plant can make a good nesting place for mice, these mice then eat the bark of the stems in winter causing die-back. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.235 Dentaria laciniata

Cut-Leaved Toothwort

5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 0.3 m hkuc  
hmim cyutli tcup hwichi hrsajlutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Dentaria laciniata is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in April, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[46, 61, 161]. A pleasant pungent peppery taste, somewhat like watercress[43, 105, 159, 183]. Added to salads or used as a relish. Leaves - raw or cooked. A peppery flavour[159].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, preferring a rich light moist soil and the shade of deciduous trees[1, 187]. A very cold-hardy plant, tolerating temperatures down to at least -20°C[187].

and various other Italian dishes[244]. The styles are extremely rich in riboflavin[137]. Water soluble[171]. Yields per plant are extremely low, about 4000 stigmas yield 25g of saffron[89]. Saffron is the world's most expensive spice, it takes 150,000 flowers and 400 hours work to produce 1 kilo of dried saffron[238]. About 25 kilos of styles can be harvested from a hectare of the plant[4]. Fortunately, only very small quantities of the herb are required to impart their colour and flavour to dishes[244]. Because of the cost, saffron is frequently adulterated with cheaper substitutes such as marigold flowers and safflower[244]. The flower styles are used as a tea substitute[183]. Root - cooked[183]. The corms are toxic to young animals[218] so this report of edibility should be treated with some caution[K].

tcanta DyeThe yellow dye obtained from the stigmas has been used for many centuries to colour cloth[4, 7, 14, 21]. It is the favoured colouring for the cloth of Indian swamis who have renounced the material world. A blue or green dye is obtained from the petals[168].

dwatta Abortifacient Anodyne Antispasmodic Aphrodisiac Appetizer Carminative Diaphoretic Emmenagogue Expectorant Narcotic Sedative StimulantSaffron is a famous medicinal herb with a long history of effective use, though it is little used at present because cheaper and more effective herbs are available[4, 7, 254]. The flower styles and stigmas are the parts used, but since these are very small and fiddly to harvest they are very expensive and consequently often adulterated by lesser products[7]. The styles and stigmas are anodyne, antispasmodic, aphrodisiac, appetizer, carminative, diaphoretic, emmenagogue, expectorant, sedative and stimulant[4, 7, 21, 174, 176, 218]. They are used as a diaphoretic for children, to treat chronic haemorrhages in the uterus of adults, to induce menstruation, treat period pains and calm indigestion and colic[4, 254]. A dental analgesic is obtained from the stigmas[7]. The styles are harvested in the autumn when the plant is in flower and are dried for later use[4], they do not store well and should be used within 12 months[238]. This remedy should be used with caution[21], large doses can be narcotic[240] and quantities of 10g or more can cause an abortion[218].

propta Seed - according to some reports this species is a sterile triploid and so does not produce fertile seed[90, 238]. However, if seed is obtained then it is best sown as soon as it is ripe in a cold frame[1]. Stored seed can be sown in the spring in a cold frame[1]. Germination can take 1 - 6 months at 18°c[164]. Unless the seed has been sown too thickly, do not transplant the seedlings in their first year of growth, but give them regular liquid feeds to make sure they do not become deficient. Divide the small bulbs once the plants have died down, planting 2 - 3 bulbs per 8cm pot. Grow them on for another 2 years in a greenhouse or frame and plant them out into their permanent positions when dormant in late summer[K]. It takes 3 years for plants to flower from seed[244]. Division of the clumps in late summer after the plant has died down[1, 4, 14]. The bulbs can be planted out direct into their permanent positions.

nwatta Prefers a well-drained sandy or loamy soil that is free from clay[137]. Prefers a sunny position[238]. Grows well on calcareous soils[27] and on hot sheltered stony banks[42]. Plants are very frost hardy[137]. They also thrive in areas with poor summers, though they usually fail to flower in such conditions[238]. Plants produce less saffron when grown on rich soils[137]. They do not flower very freely in Britain[90]. Saffron has been cultivated for over 4,000 years for the edible dye obtained from the flower stigmas[1]. It was at one time commercially grown in Britain and the town Saffron Walden obtained its name because of this. There is at least one named form. 'Cashmirianus' comes from Kashmir and has large high quality corms. It yields about 27 kilos of rich orange stigmas per hectare[183]. When inhaled near to, the flowers have a delicate perfume[245]. Unlike most members of this genus, the flowers do not close of a night time or in dull weather[245]. The flowers are only produced after hot, dry summers[245]. Plants tend to move considerably from their original planting place because of their means of vegetative reproduction, it is therefore wise not to grow different species in close proximity[1]. Any planting out is best done in late spring or early summer[245]. Plants take 4 - 5 years to come into flowering from seed. The plant is heat tolerant in zones 8 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the

heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is a corm swelling at the stem base [1-2].

## 6.2.231 Allium platycaule

Broadstemmed Onion

5 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 0.1 m hkuc htut cyutli kyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Allium platycaule is a BULB growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Bulb - raw or cooked[177, 257]. The bulbs are formed in clusters on a rhizome and are about 20 - 35mm in diameter[200]. Leaves - raw or cooked. Used as an onion-flavoured relish[257]. Flowers - raw. Used as a garnish on salads. The seed heads can be placed in hot ashes for a few minutes, then the seeds extracted and eaten[257].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.232 Allium stellatum

Prairie Onion, Autumn onion

5 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 0.8 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Allium stellatum is a BULB growing to 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. Closely related to *T. tomentos*[1]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.111 Pyrus balsanae

5 tlin 9 cyuc 3 kcaok 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli hgattcup hwicli hrasljutnykfrrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Pyrus balsanae is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A reasonable size, to 2.5cm[200]. The flesh is rather hard and harsh, though it becomes soft and sweet when bled and then makes a very good dessert fruit[K].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[1]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Hardy to about -15°C[200]. Plants are growing and fruiting well at Kew Botanical Gardens[K].

## 6.2.112 Rhus punjabensis sinica

5 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 12 m hkuc htut cyutli tcup hwicli hrasljutnyk hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Rhus punjabensis sinica is a deciduous Tree growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit - raw or cooked[2, 105, 145]. The fruit is small with very little flesh, but it is produced in fairly large panicles and so is easily harvested. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[K]. The mixture should not be boiled since this will release tannic acids and make the drink astringent.

tcanta Dye Mordant Oil TanninAn oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though

they emit a pungent smoke[4]. The leaves are rich in tannin[145]. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169].

dwatta Antiseptic Astringent HaemostaticAn excretion produced on the leaf by an insect *Melaphis chinensis* or *M. paitan* is antiseptic, astringent and haemostatic[176]. It is used in the treatment of persistent cough with blood, chronic diarrhoea, spontaneous sweating, night sweats, bloody stool, urorrhoea and bloody sputum. It is used applied externally to burns, bleeding due to traumatic injuries, haemorrhoids and ulcers in the mouth[176].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. The young growth in spring can be damaged by late frosts. This species is closely allied to *R. potaninii*[11]. This is the form of *R. punjabensis* that is most commonly grown in Britain[200]. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species such as this one are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, *Toxicodendron*, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.113 Malus fusca

Oregon Crab, Oregon crab apple

5 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasljutnykfrrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Malus fusca is a deciduous Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Pectin PectinFruit - raw or cooked[11, 101]. Up to 2cm in diameter[229]. An agreeable sub-acid taste, it can be eaten out of hand or made into jellies, preserves etc[183]. The fruit can be left on the tree until there have been some autumn frosts, this will soften the fruit and make it somewhat less acid[K]. The fruit is rich in pectin so it can be added to pectin-low fruits when making jams or jellies[183, 257]. Pectin is also said to protect the body against radiation[201]. tcanta Pectin Pectin WoodThe fruit is a source of pectin[183]. Wood - larid, close grained, durable. Used for mallets, tool handles and bearings[11, 82, 99, 101, 226].

dwatta Antirheumatic Astringent Diuretic Dysentery Eczema Laxative Ophthalmic Pectoral Skin Stomachic TB TonicOregon crab was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. In particular, it gained a reputation with some tribes as a heal-all, especially useful for treating any of the internal organs[257]. It is little, if at all, used in modern herbalism. The trunk, bark and inner

bark are antirheumatic, astringent, blood purifier, cardiac, diuretic, laxative and tonic[257]. A decoction has been used in the treatment of coughs, stomach ulcers, dysentery, diarrhoea, rheumatism and consumption[257]. The shredded bark has been used to treat blood spitting[257]. A poultice of the chewed bark has been applied to wounds[257]. An infusion of the bark is used as an eyewash[257]. A decoction of the bark is used as a wash on cuts, eczema and other skin problems[257]. An infusion of the bark, combined with wild cherry bark (*Prunus* sp.) has been used as a cure-all tonic[257]. The juice scraped from the peeled trunk has been used as an eye medicine[257]. The soaked leaves have been chewed in the treatment of lung problems[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°c and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. A very ornamental plant[1], it is slow-growing in the wild[229]. Hybridizes freely with other members of this genus[200]. The fruit is a good wildlife food source, especially for birds[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.114 *Rhus punjabensis*

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Rhus punjabensis* is a deciduous Tree growing to 12 m (39ft 4in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Fruit OilEdible Uses: Drink OilFruit - raw or cooked[2, 105, 145]. The fruit is small with very little flesh, but it is produced in fairly large panicles and so is easily harvested. When soaked for 10 - 30 minutes in hot or cold water it makes a very refreshing lemonade-like drink (without any fizz of course)[K]. The mixture should not be boiled since this will release tannic acids and make the drink astringent.

tcanta Dye Mordant OilAn oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The leaves are rich in tannin[145]. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169].

dwatta Antiseptic Astringent HaemostaticAn excretion produced on the leaf by an insect *Melaphis chinensis* or *M. paitan* is antiseptic, astringent and haemostatic[176]. It is used in the treatment of persistent cough with blood, chronic diarrhoea, spontaneous sweating, night sweats, bloody stool, urorrhoea and bloody sputum. It is used applied externally to burns, bleeding due to traumatic injuries, haemorrhoids and ulcers in the mouth[176].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. This soak water can be drunk and has a delicious lemon-flavour. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they

are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. The young growth in spring can be damaged by late frosts. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. This species is closely related to *R. potaninii*[11]. *R. punjabensis sinica* is the form of this plant that is most usually grown in Britain[200]. Many of the species in this genus are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, *Toxicodendron*, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.115 *Hovenia dulcis*

Japanese Raisin Tree

5 tlin 9 cyuc 3 kcaak 3 tcan 2 dwat 10 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Hovenia dulcis* is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: SweetenerFruit - raw or cooked[2, 11, 158]. They can be dried when they have the sweet flavour and texture of raisins and can be used similarly[183]. The fruit is sweet and fragrant[105, 147] with a pear-like flavour[218]. Dry and sub-acid[61]. It is not a true fruit but a swollen receptacle[200]. The fruit is up to 3cm long[2], it contains 11.4% glucose, 4.7% fructose and 12.6% sucrose[218]. A sweet extract of the seed, boughs and young leaves is used as a substitute for honey[183]. The seed contains 15% protein and 7.8% fat[218].

tcanta WoodThe wood is hard and fine grained. It is good for making furniture[266].

dwatta Antispasmodic Febrifuge LaxativeAntispasmodic, febrifuge, laxative[147, 178]. The fruit is antispasmodic, febrifuge, laxative and diuretic[218]. The seeds are diuretic and are used in the treatment of alcohol overdose[218]. The seeds are used to relieve intoxication due to wine[240]. The stem bark is used in the treatment of rectal diseases[218].

propta Seed - germinates freely if sown as soon as it is ripe in a cold frame[200]. Stored seed should be scarified and sown in early spring[113], it may not germinate for a year. Prick out the seedlings into individual pots when large enough to handle and grow on for at least their first winter in a greenhouse. Plant out in late spring after the last expected frosts and give some winter protection for their first couple of years outdoors. Cuttings of half-ripe wood, July/August in a frame[200]. Cuttings of mature wood, late autumn in a frame[200].

nwatta Grows well in a fertile sandy loam in a sunny position[200]. Although the dormant plant is hardy to at least -15°c in Britain, it really prefers a continental climate to fully ripen its wood, it is then hardy to about -25°c[200]. The shoot tips are sometimes damaged by winter frosts in Britain[1] and the young growth in spring can also be damaged by late frosts[K]. The Japanese raisin tree is said to grow well in Cornwall[59], though our experience of this plant so far (1995) is that it is very difficult to establish. Perhaps older plants are as hardy as the reports above suggest, but younger plants are quite tender and often die in their first few winters

Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 6.2.228 *Allium vineale*

Crow Garlic, Wild garlic, Compact onion, False Garlic, Wild, Onion

5 tlin 8 cyuc 3 kcaak 2 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Allium vineale* is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from October to August, in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves - raw or cooked[5, 177]. Rather stringy, they are used as a garlic substitute[2, 12, K]. The leaves are available from late autumn until the following summer, when used sparingly they make a nice addition to the salad bowl[8, 183, K]. Bulb - used as a flavouring[105, 161, 177]. Rather small, with a very strong flavour and odour[183]. The bulbs are 10 - 20mm in diameter[200]. Bulbils - raw or cooked. Rather small and fiddly, they have a strong garlic-like flavour[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20]. The juice of the plant can be rubbed on exposed parts of the body to repel biting insects, scorpions etc[257].

dwatta Antiasthmatic Blood purifier Carminative Cathartic Diuretic Expectorant Stimulant VasodilatorThe whole plant is antiasthmatic, blood purifier, carminative, cathartic, diuretic, expectorant, hypotensive, stimulant and vasodilator[20, 257]. A tincture is used to prevent worms and colic in children, and also as a remedy for croup[257]. The raw root can be eaten to reduce blood pressure and also to ease shortness of breath[257]. Although no other specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Plants do not need any encouragement, they are more than capable of propagating themselves. Bulbils are produced in abundance in the summer and are the main means by which the plant spreads.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[1]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. This species is a pernicious weed of grassland in Britain[1], spreading freely by means of its bulbils[203]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.229 *Lactuca perennis*

Perennial Lettuce

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Lactuca perennis* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-

fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[27, 46, 61, 105, 183]. The leaves are often blanched to reduce any bitterness. They are fairly acceptable raw in salads (even without being blanched), especially in late winter and spring when the flavour is quite mild[K]. The leaves do become much more bitter in the summer, however, especially as the plant comes into flower[K].

tcanta None known

dwatta Although we have seen no specific reports for this species, most if not all members of the genus have a milky sap that contains the substance 'lactucarium' and can probably be used as the report below details[K]. The whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222].

propta Seed - sow April in a greenhouse, only just covering the seed. Germination is usually fairly quick When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. It is best to pot up the divisions and keep them in a lightly shaded position in a cold frame until they are growing away well. Plant them out in the summer. Root cuttings in spring[K].

nwatta Prefers a light well-drained sandy loam and a sunny position[187]. Plants are hardy to about -25°c[187]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

### 6.2.230 *Crocus sativus*

Saffron

5 tlin 9 cyuc 3 kcaak 2 tcan 3 dwat 0.1 m hkuc hmimhtut cyutli kyuctcup hwicli vyhshrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Crocus sativus* is a CORM growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from October to May, in flower in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: Colouring Condiment TeaThe flower styles are commonly used as a flavouring and yellow colouring for various foods such as bread, soups, sauces, rice and puddings[2, 4, 7, 14, 21, 27, 34, 183]. They are an essential ingredient of many traditional dishes such as paella, bouillabaisse, risotto milanese



in small quantities it also aids digestion[254]. It can be applied as a poultice and will relieve any kind of roseola and is effective wherever there are fragile superficial veins[7]. An infusion of the fresh or dried herb can be added to the bath water and its emollient property will help to reduce inflammation - in rheumatic joints for example - and encourage tissue repair[254]. Chickweed is best harvested between May and July, it can be used fresh or be dried and stored for later use[4, 238]. A decoction of the whole plant is taken internally as a post-partum depurative, emmenagogue, galactagogue and circulatory tonic[218]. It is also believed to relieve constipation and be beneficial in the treatment of kidney complaints[244]. The decoction is also used externally to treat rheumatic pains, wounds and ulcers[4, 218, 222]. The expressed juice of the plant has been used as an eyewash[244].

propta Seed

nwatta A perennial herbaceous wildflower for Partial or Dappled Shade. Water Preferences: Mesic (environment or habitat containing a moderate amount of moisture). Soil pH preferences: Slightly acid (6.1 - 6.5). Flowers: White/Showy. Bloom Time: Mar to May. Resistances: Humidity tolerant.

## 6.2.226 Gaultheria pyroloides

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Gaultheria pyroloides is an evergreen Shrub growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 11, 183]. A sweet flavour. The fruit is about 10mm in diameter[200].

tcanta None known

dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division can be carried out at almost any time of the year, but works best in the spring just before new growth begins[K]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moist but not boggy humus rich soil in shade or semi-shade[11, 182]. A peat and moisture loving species, it requires a lime-free soil[11, 182]. An easily grown plant, it succeeds in most situations[182]. This species is often confused with *G. pyroloides*[11] and *G. pyrolifolia*[182]. It was mistakenly originally included in *G. pyroloides* though it is in fact quite distinct and is closely related to *G. cuneata*[11, 182]. Further evidence has shown that the original description of *Gaultheria pyroloides* refers to the Japanese species, whilst *Gaultheria pyrolifolia* is a distinct Himalayan species[266]. *Gaultheria miqueliana* is thus a synonym of *G. pyroloides*[266]. A very ornamental plant[11]. The flowers are scented[245]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.227 Petasites japonicus

Sweet Coltsfoot, Japanese sweet coltsfoot, Butterbur  
5 tin 9 cyuc 3 kcaak 1 tcan 2 dwat 0.6 m hkuc pcmhmmhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli ynphanjen hjonli

drutta Petasites japonicus is a PERENNIAL growing to 0.6 m (2ft) by 1.5 m (5ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in February, and the seeds ripen in March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: Flowers StemEdible Uses: Leaf stalks - cooked and used like rhubarb[1, 2, 46, 116]. The stems can be up to 1.2 metres long[104]. They can be boiled and seasoned, pickled and used in winter soups or preserved in miso[183]. They can be boiled, dipped in cold water then peeled and baked - they have a pleasant fragrant taste[206]. Flower buds cooked or used as a flavouring[1, 22, 46, 61, 105]. A slightly bitter yet agreeable flavour[116, 206], they are much prized in Japan[183]. They can be eaten whilst still green with miso or boiled down in soy sauce[183]. The young flowering stems can be eaten cooked[206].

tcanta MiscellanyThe leaves of the sub-species *P. japonicus giganteus* are used as umbrellas by Japanese children[187]. The leaf stalks can be used as walking sticks[206]. Plants can be grown as ground cover in damp shady places[206]. They are too invasive for most gardens and should only be used where they have plenty of room[208].

dwatta Antiasthmatic Antispasmodic Expectorant Miscellany PoulticeThe plant (though the exact part of the plant used is not specified) is antiasthmatic, antispasmodic, expectorant and poultice[147]. A decoction is used in the treatment of chronic coughing and pulmonary 'deficiency', laboured or difficult breathing and asthma, constant sputum formation and pulmonary tuberculosis[147].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Container, Ground cover, Massing, Woodland garden. Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Requires a moist shady position[187]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Its roots are very difficult to eradicate[200]. The sub-species *P. japonicus giganteus* has huge leaves up to 1.5 metres across on stems 2 metres tall[187]. It has a poorer flavour than the species type[206]. Sometimes cultivated in E. Asia as a food plant[1, 58]. Dioecious, male and female plants must be grown if seed is required. Special Features:Attractive foliage, Not North American native, Invasive, Wetlands plant, Flower characteristics are unknown. Petasites japonicus giganteus (Petasites japonicus subsp. giganteus F.Schmidt ex Kitam) is a larger version of Petasites japonicus commonly know as giant fuki. It can grow in similar hardiness zones to fuki but can grow in wetter conditions and tolerate more sun. It can grow to 5 ft (1.5m). The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat

outdoors[K]. The Japanese raisin tree is cultivated for its edible fruit in Japan. The small white flowers are scented and are produced in terminal cymes[245]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 6.2.116 Amelanchier arborea

Downy Serviceberry, Alabama serviceberry, Juneberry, Common Serviceberry, Downy Serviceberry  
5 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier arborea is a deciduous Tree growing to 10 m (32ft) by 12 m (39ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked[101, 227]. The fruit has a few small seeds at the centre, some forms are dry and tasteless[11, 177, 227] whilst others are sweet and juicy[183, 227]. The fruit ripens unevenly over a period of 2 - 3 weeks and is very attractive to birds, this makes harvesting them in quantity rather difficult[229]. The fruit is borne in small clusters and is up to 10mm in diameter[200]. It is rich in iron and copper[226].

tcanta Soil stabilizationThe trees have an extensive root system and can be planted on banks etc for erosion control[200]. Wood - close-grained, hard, strong, tough and elastic. It is one of the heaviest woods in N. America, weighing 49lb per cubic foot[227, 274]. Too small for commercial interest, it is sometimes used for making handles[227, 229].

dwatta Anthelmintic Astringent Tonic VDA compound infusion of the plant has been used as an anthelmintic, in the treatment of diarrhoea and as a spring tonic[257]. An infusion of the bark has been used in the treatment of gonorrhoea[257].

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Landscape Uses: Specimen, Street tree, Woodland garden. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for

use in the garden as edible ornaments. The main drawback to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. The plant becomes dwarfed when growing in sterile (poor and acid) ground[227]. Hybridises with *A. bartramiana*, *A. canadensis*, *A. humilis* and *A. laevis*. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:Attracts birds, North American native, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 9 through 4. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 6.2.117 Castanea seguinii

Chinese Chinquapin  
5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc htut cyutli hgtakyuctup hwicli vyhshrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea seguinii is a deciduous Tree growing to 10 m (32ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 177]. Small, but a good flavour[61, 183]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K].

tcanta TanninThe bark, leaves, wood and seed husks all contain tannin. Wood - hard, strong, light. Used for fence posts etc.

dwatta None known

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K].

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. This species can vary in size from a shrub 4 metres tall to, rarely, a tree 12 metres tall[266]. It is allied to the dwarf N. American species *C. pumila*[11], but unlike that species it has 3 seeds per bur[183]. Valued in breeding programmes because of its dwarf stature and heavy bearing at an early age[183]. Sometimes cultivated for its edible seed in China[266]. Although it is winter-hardy in most of Britain, this species only really thrives in areas with hot summers[200]. An excellent

soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.118 Fraxinus ornus

Manna Ash, Flowering ash

5 tlin 6 cyuc 3 kcaak 0 tcan 3 dwat 9 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Fraxinus ornus is a deciduous Tree growing to 9 m (29ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen from September to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: MannaEdible Uses: Manna - a sweetish exudate is obtained from the stems by incision[2, 4, 11, 114, 171, 183]. The quality is better from the upper stems. A mild sweet taste[114], its main use is as a mild and gentle laxative[171], though it is also used as a sweetener in sugar-free preparations and as an anti-caking agent[238]. The tree trunk must be at least 8cm in diameter before the manna can be harvested[4]. A vertical series of oblique incisions are made in the trunk in the summer once the tree is no longer producing many new leaves[4]. One cut is made every day from July to the end of September. A whitish glutinous liquid exudes from this cut, hardens and is then harvested[2]. Dry and warm weather is essential if a good harvest is to be realised[4]. The tree is harvested for 9 consecutive years, which exhausts the tree. This is then cut down, leaving one shoot to grow back. It takes 4 - 5 years for this shoot to become productive[2]. Average yields of 6 kilos per hectare of top quality manna, plus 80 kilos of assorted manna are achieved[2].

tcanta None known

dwatta Laxative TonicThe manna obtained from the trunk is a gentle laxative and a tonic[4, 46]. It is especially valuable for children and pregnant women[4, 238]. Its action is normally very mild, though it does sometimes cause flatulence and pain[4].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Landscape Uses:Pollard, Specimen. Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[11, 200]. Succeeds in exposed positions[200] and in alkaline soils[11]. Requires a moist soil according to some reports[1, 11] whilst another says that it succeeds in drier soils[200]. Plants are tolerant of atmospheric pollution[200]. Although the dormant plant is very cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A very ornamental plant[1], the manna ash is cultivated for its edible manna in Sicily and Calabria[89, 142]. The flowers are sweetly scented[245]. Trees have a very dense canopy[11]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Not North American native, Attractive flowers or blooms.

### 6.2.119 Amelanchier interior

Pacific serviceberry

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Amelanchier interior is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A sweet taste[177, K] and a juicy texture[229, K], even before the fruit is fully ripe[K]. The fruit is produced in small clusters and is up to 8mm in diameter[229]. The fruit is rich in iron and copper[226]. This species has been seen fruiting well at Kew where the fruit ripened about 3 weeks later than most of the other species[K].

tcanta None known

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta We have very little information on this species. We do not know if it will be hardy in Britain, though it is growing and fruiting well at Kew Gardens in London[K] and judging by its native range it should succeed outdoors in most parts of the country. This species is not stoloniferous[43]. The following notes are based on the general needs of the genus. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 6.2.120 Arundinaria gigantea

Canebrake bamboo, Cane Reed, Giant cane

5 tlin 9 cyuc 3 kcaak 4 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Arundinaria gigantea is an evergreen Bamboo growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Seed Shoots StemEdible Uses: Young shoots - cooked[11, 22, 46, 105, 183]. Used as a pot-herb[236]. Seed - cooked[46, 61, 161]. It can be used

above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 6.2.223 Satureja hortensis

Summer Savory

5 tlin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwisp hpa7tmwatli fyifxre7t hjonli

drutta Satureja hortensis is a ANNUAL growing to 0.3 m (1ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Condition TeaLeaves - raw or cooked[1, 2, 20, 27, 34, 37, 52]. An aromatic, slightly peppery flavour, they are used mainly as a flavouring for cooked foods, especially the more difficult to digest foods such as beans where they compliment the flavour and reduce flatulence[183, 244]. They are also used as a garnish for salads etc[183]. The leaves can be used fresh or dried[183]. A herb tea is made from the leaves[14]. The leaves are harvested just before the plant comes into flower[183]. A tangy, marjoram-like flavour[183]. The flowering shoots contain about 0.5% essential oil[7], this is used as a food flavouring[46, 61, 105].

tcanta Essential RepellentThe essential oil from the flowering shoots is used extensively in perfumery, giving a particular quality to the fragrance[7]. When grown near beans it repels insect pests[201]. Dynamic accumulator.

dwatta Antirheumatic Antiseptic Aromatic Carminative Digestive Expectorant Stings StomachicSummer savory is most often used as a culinary herb, but it also has marked medicinal benefits, especially upon the whole digestive system[254]. The plant has a milder action than the closely related winter savory, *S. montana*[254]. The whole herb, and especially the flowering shoots, is antiseptic, aromatic, carminative, digestive, expectorant and stomachic[4, 7, 14, 21]. Taken internally, it is said to be a sovereign remedy for colic and a cure for flatulence[4], whilst it is also used to treat nausea, diarrhoea, bronchial congestion, sore throat and menstrual disorders[238]. It should not be prescribed for pregnant women[238]. A sprig of the plant, rubbed onto bee or wasp stings, brings instant relief[4]. The plant is harvested in the summer when in flower and can be used fresh or dried[238]. The essential oil forms an ingredient in lotions for the scalp in cases of incipient baldness[7]. An ointment made from the plant is used externally to relieve arthritic joints[7].

propta Seed - sow April in situ and only just cover[1]. Germinates in about 2 weeks. The plant strongly resents root disturbance so do not transplant it. In areas with mild winters an autumn sowing will provide an earlier supply of leaves[200].

nwatta A very easily grown plant when given suitable conditions, it prefers a rich light soil with plenty of moisture[1, 4, 14, 27] and succeeds in a hot dry sunny position[200]. It prefers growing in an alkaline soil[200] but is not too fussy. It is very intolerant of soils that remain damp and dislikes shade[200]. Summer savory is often grown as a culinary herb. It is a good companion plant in the garden, where it helps to repel insect pests and grows especially well with onions and beans[14, 18, 20]. A fast-growing plant, it can be harvested within 2 months of sowing the seed[244]. If cut back as the flower buds appear, it will produce a fresh flush of leaves[1]. Summer savory seeds can prevent the germination of nearby seeds[201]. The leaves have an aromatic fragrance[245]. The flowers are very attractive to bees[7, 14]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.224 Gaylussacia dumosa

Dwarf Huckleberry

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaylussacia dumosa is a deciduous Shrub growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked and used as a pie filling etc[3, 62, 183]. Juicy and deliciously spicy[183]. Watery and insipid[235], though commonly eaten according to another report[177]. Not much valued[11]. The fruit is about 8mm in diameter[235].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 1 month warm stratification followed by 2 months cold[113]. When large enough to handle, prick the seedlings out into individual pots of lime-free compost and grow them on in light shade in a greenhouse or cold frame for at least their first winter. Plant out into their permanent positions in late spring or early summer when they are at least 15cm tall. Cuttings of half-ripe wood, July/August in a frame[200]. Layering. Division in spring.

nwatta Requires a lime-free moist peaty soil, thriving in sun or part shade[1, 182]. Prefers a sandy soil[11]. Succeeds in wetter soils than other members of this genus[200]. Plants are hardy to about -15°C[200]. A very ornamental[1] and freely suckering shrub[182].

### 6.2.225 Stellaria pubera

Star chickweed

5 tlin 8 cyuc 3 kcaak 3 tcan 1 dwat 0.2 m hkuc pcmihmm cyutli tcup hwicli jlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Stellaria pubera is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees, Insects. It is noted for attracting wildlife. Suitable for: medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Leaves. Lettuce like greens - good [2-1]. Fresh greens - salad, potherb, dried and added to soups. Seeds sprouted and eaten [318-1]. Probably similar qualities to *Stellaria media*.

tcanta A good medium to high density groundcover [1-2]. Soap - Contains saponins [318-1]. Insectory: The flowers of Star Chickweed attract cuckoo bees (*Nomada* spp.), mason bees (*Osmia* spp.), Halictid bees (*Augochlorella* spp., *Lasioglossum* spp.), Andrenid bees (*Andrena* spp.), the Giant Bee Fly (*Bombilybia* major), Syrphid flies, and other miscellaneous flies. Butterflies and skippers are rare visitors of the flowers. These insects are attracted primarily to the nectar of the flowers, although some of the bees collect pollen for their larvae and some of the flies feed on pollen as adults. Insects that feed on *Stellaria* spp., including possibly this chickweed, are the aphid *Abstrusomyzus phloxae*, the Pale Tortoise Beetle (*Cassida flaveola*), and caterpillars of a moth, *Lobocleta ossularia* (*Drab Brown Wave*) [318-1]. Domestic animal forage: Used to feed chickens [318-1].

dwatta Although no information could be found for this species it is likely to have similar properties to *Stellaria media*. *Stellaria media* (Chickweed) has a very long history of herbal use, being particularly beneficial in the external treatment of any kind of itchy skin condition[238]. It has been known to soothe severe itchiness even where all other remedies have failed[254]. In excess doses chickweed can cause diarrhoea and vomiting[254]. It should not be used medicinally by pregnant women[254]. The whole plant is astringent, carminative, demulcent, diuretic, expectorant, laxative, refrigerant, vulnerary[4, 7, 9, 21, 54, 165, 222]. Taken internally it is useful in the treatment of chest complaints and

without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. The seed is anodyne and galactagogue[218]. Lettuce has acquired a folk reputation as an anaphrodisiac, anodyne, carminative, diuretic, emollient, febrifuge, hypoglycaemic, hypnotic, narcotic, parasiticide and sedative[218].

propta Seed - sow a small quantity of seed in situ every 2 or 3 weeks from March (with protection in cooler areas) to June and make another sowing in August/September for a winter/spring crop. Only just cover the seed. Germination is usually rapid and good, thin the plants if necessary, these thinnings can be transplanted to produce a slightly later crop (but they will need to be well watered in dry weather). More certain winter crops can be obtained by sowing in a frame in September/October and again in January/February.

nwatta Prefers a light sandy loam[1]. Succeeds in most well-drained, humus-rich soils but dislikes acid conditions[1, 16]. Plants strongly dislike dry conditions, quickly running to seed in such a situation. Early and late sowings are best in a sunny position, but summer crops are best given a position with some shade in order to slow down the plants tendency to go to seed and to prevent the leaves becoming bitter[18, 20]. The garden lettuce is widely cultivated in many parts of the world for its edible leaves and is probably the most commonly grown salad plant. This is the curled or leaf lettuce. It does not form a central heart but produces a loose rosette of basal leaves and can be harvested on a cut and come again basis. There are many named varieties[183] capable of providing fresh leaves throughout the year if winter protection is given in temperate areas. Lettuces are quite a problematic crop to grow. They require quite a lot of attention to protect them from pests such as slugs, aphids and birds. If the weather is hot and dry the plants tend to run very quickly to seed, developing a bitter flavour as they do so. In wet weather they are likely to develop fungal diseases. In addition, the seed needs to be sown at regular intervals of 2-3 weeks during the growing season in order to provide a regular supply of leaves. Lettuces make a good companion plant for strawberries, carrots, radishes and onions[18, 20, 201]. They also grow well with cucumbers, cabbages and beetroot[201].

## 6.2.222 Galium odoratum

Sweet Woodruff, Sweetscented bedstraw, Bedstraw

5 tin 9 cyuc 3 kcaak 3 tcan 3 dwat 0.2 m hkuc  
pimhmim cyutli kyucup hwcili hrasjlytnyk hpa7tli frus-  
flatprikwisslip hpa7tmwatli fyfixre7t hjonli

drutta Galium odoratum is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers LeavesEdible Uses: Condiment Drink TeaLeaves - raw or cooked[62]. The leaves are coumarin-scented (like freshly mown hay), they are used as a flavouring in cooling drinks[2, 9, 27] and are also added to fruit salads etc[183, 200]. The leaves are soaked in white wine to make 'Maitrank', an aromatic tonic drink that is made in Alsace[238]. A fragrant and delicious tea is made from the green-dried leaves and flowers[2, 183, 268]. Slightly wilted leaves are used, the tea has a fresh, grassy flavour[200]. The sweet-scented flowers are eaten or used as a garnish[183].

tcanta Dye Pot-pourri Repellent StrewingA red dye is obtained from the root[168]. Soft-tan and grey-green dyes are obtained from the stems and leaves[168]. A good ground-cover plant for growing on woodland edges or in the cool shade of shrubs[24, 200]. It spreads rapidly at the roots[28, 197, 208]. It is an ideal carpeting plant for bulbs to grow

through[K]. Although the fresh plant has very little aroma, as it dries it becomes very aromatic with the scent of newly-mown grass and then retains this aroma for years[2, 200]. It is used in the linen cupboard to protect from moths etc.[4, 14] It was also formerly used as a strewing herb and is an ingredient of pot-pourri[238]. It was also hung up in bunches in the home in order to keep the rooms cool and fragrant during the summertime[245].

dwatta Antispasmodic Cardiac Diaphoretic Diuretic Homeopathy SedativeSweet woodruff was widely used in herbal medicine during the Middle Ages, gaining a reputation as an external application to wounds and cuts and also taken internally in the treatment of digestive and liver problems[4]. In current day herbalism it is valued mainly for its tonic, diuretic and anti-inflammatory effect[254]. The leaves are antispasmodic, cardiac, diaphoretic, diuretic, sedative[9, 13, 21, 200]. An infusion is used in the treatment of insomnia and nervous tension, varicose veins, biliary obstruction, hepatitis and jaundice[9, 238]. The plant is harvested just before or as it comes into flower and can be dried for later use[9]. One report says that it should be used with caution[21] whilst another says that it is entirely safe[9]. Excessive doses can produce dizziness and symptoms of poisoning[268]. The dried plant contains coumarins and these act to prevent the clotting of blood - though in excessive doses it can cause internal bleeding[254]. The plant is grown commercially as a source of coumarin, used to make an anticoagulant drug[268]. Do not use this remedy if you are taking conventional medicine for circulatory problems or if you are pregnant[254]. Both Asperuloside (a terpenoid) and Coumarin (a benzopyrone) occur in some species of Galium. Asperuloside can be converted into prostaglandins (hormone-like compounds that stimulate the uterus and affect blood vessels), making the genus of great interest to the pharmaceutical industry[238]. A homeopathic remedy made from the plant is used in the treatment of inflammation of the uterus[238].

propta Seed - best sown in situ as soon as it is ripe in late summer[200]. The seed can also be sown in spring though it may be very slow to germinate[200]. A period of cold stratification helps reduce the germination time. Lots of leafmold in the soil and the shade of trees also improves germination rates. Division in spring. The plant can also be successfully divided throughout the growing season if the divisions are kept moist until they are established[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings of soft wood, after flowering, in a frame.

nwatta Landscape Uses:Ground cover, Massing, Rock garden, Woodland garden. Prefers a loose moist leafy soil in some shade[200]. Tolerates dry soils but the leaves quickly become scorched when growing in full sun[200]. This species does not thrive in a hot climate[200]. Prefers a moist calcareous soil[9, 13, 14]. Dislikes very acid soils[187]. Tolerates a pH in the range 4.3 to 8.3. This species is very tolerant of atmospheric pollution and grows well in towns[208]. A very cold-hardy plant, tolerating temperatures down to about -25°C[187]. Sweet woodruff is occasionally cultivated in the herb garden for its medicinal and other uses. The dried foliage has the sweet scent of newly mown hay[245]. A very ornamental plant[1] but it spreads rapidly[28] and can be invasive[200]. However, this is rarely to the detriment of other plants since these are normally able to grow through it[200]. It does no harm to any plants more than 60cm tall[208]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, Naturalizing, Suitable for dried flowers, Fragrant flowers. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. In garden design, as well as the

as a wheat substitute[2, 105], for which it is not much inferior[213], but it is rather small and difficult to collect in quantity[159]. The plants only flower at irregular intervals of several years.

tcanta Basketry Fodder Hedge Musical Soil stabilization WeavingAgroforestry Uses: With its extensive running root system, the plant is ideal for helping to control soil erosion, especially along the sides of rivers[352]. The extensive growth of the plant provides streambank stabilization, sediment retention, and bioaccumulation of nutrients and toxins[1050]. So long as it can be restrained, the plant makes an excellent, dense hedge or screen[352]. The canes are used as pipe-stems, are woven into baskets and mats plus a variety of other purposes[169, 236]. The hollow stems can be made into flutes[257]. Carbon Farming Solutions - Industrial Crop: biomass (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. Fodder: bank.

dwatta CatharticThe root is cathartic. A decoction has been used to stimulate the kidneys and 'renew strength'[257].

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3-6 months. When large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded place in the greenhouse until large enough to plant out. Bamboos only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Rhizome cuttings. Basal cane cuttings.

nwatta Fodder: Bank Management: Managed Multi-stem Wild CropPrefers an open loam of fair quality and a position sheltered from cold drying winds[1, 11, 25]. Succeeds on peaty soils. Requires abundant moisture and plenty of organic matter in the soil. Plants are intolerant of drought[1]. Succeeds in full sun or dappled shade in warm, humid, damp conditions[200]. Some reports say that this plant is only hardy in S.W. England[1, 11, 25] though another report says that the roots are hardy to about -30°C if they are heavily mulched[169]. This plant used to form very extensive stands in much of south-eastern N. America, but it provides a nutritious forage and is very easily destroyed by the continuous grazing of cattle or the rooting of pigs and so has been greatly reduced in the wild[236]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The rootstock is running, forming new shoots from late May[25]. Carbon Farming Solutions - Managed bamboo forest sequester more carbon than wild bamboo and the same as fast-growing tropical trees like eucalyptus. Cultivation: minor global crop. Management: managed multistem (Describes the non-destructive management systems that are used in cultivation) [1-1]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes

or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.121 Actinidia coriacea

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 8 m hkuc  
hmimhtut cyutli tcup hwcili hrasjlytnyk hpa7tli flatprikwiv  
hpa7tmwatli nyanhjen hjonli

drutta Actinidia coriacea is an evergreen Climber growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 183]. Small but very juicy and full of seeds[182]. The fruit is up to 2cm long[198]. It contains a number of small seeds, but these are easily eaten with the fruit[K].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2-3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. A fairly hardy plant, succeeding in many parts of the country[1], but young spring growth is susceptible to frost damage[160]. Plants are semi-evergreen in mild winters[219]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. The flowers are softly scented[245]. This is a climbing plant, supporting itself by twining around branches etc[200]. Plants are often erroneously labelled A. henryi in British nurseries[219]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if fruit and seed is required.

## 6.2.122 Crataegus pinnatifida

Chinese Haw

5 tin 9 cyuc 3 kcaak 2 tcan 3 dwat 7 m hkuc  
hmimhtut cyutli hgattcuphja7n hwcili hrasjlytkfrip hpa7tli  
flatprikwivslip hpa7tmwatli xre7t hjonli

drutta Crataegus pinnatifida is a deciduous Tree growing to 7 m (23ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. A pleasant flavour[178]. The orange fruit

has a mealy texture with an acid taste and a slight bitterness but is fairly nice raw[K]. It ripens fairly late, specimens seen at the end of October 1998 were not quite fully ripe[K]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. The fruit is about 15mm in diameter[200], though in some forms it can be 25mm in diameter[266]. A nutritional analysis is available[218]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Alternative Antibacterial Anticholesterolic Antidote Antiscurbutic Cardiotoxic Deobstruent Hypotensive Laxative Stimulant Stomachic VasodilatorThe fruit is antibacterial, anticholesterolic, cardiotoxic, hypotensive, stomachic, vasodilator. It contains several medicially active constituents including flavonoids and organic acids[279]. It has been shown to lower blood cholesterol levels and to improve blood circulation[176, 238, 279]. It is used in Korea in the treatment of abdominal distension, pain, diarrhoea and to induce menstruation[279]. The dried fruit is alterative, antiscurbutic, deobstruent, laxative, stimulant and stomachic[218]. The fruits and flowers of hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222]. The seed is recommended in the treatment of difficult labour, hernia and swollen genitals[218]. The leaves and twigs are used as an antidote to varnish poisoning (from certain *Rhus* spp)[218]. The root is used in the treatment of nausea and vomiting[218].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta Industrial Crop: Medicinal Management: Standard Minor Global CropA very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Most trees have very few thorns, some forms are thorn-free[202]. A very ornamental plant[1, 11]. The sub-species *C. pinnatifida* major has larger fruit than the type species, it is cultivated for this fruit in China[46, 178, 200] Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. For

polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 6.2.123 Pyrus pyraeaster

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 7 m hkuc  
hminhtut cyutli hgactup hwicli hrasjlutnykfrp hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Pyrus pyraeaster is a deciduous Tree growing to 7 m (23ft) by 5.5 m (18ft). See above for USDA hardiness. It is hardy to UK zone 6. The seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is often borne in abundance and is up to 35mm in diameter. It ripens in late summer to early autumn. It is rather hard and astringent at first, but blets as soon as it falls from the tree and then has quite a good flavour, becoming soft and quite juicy[K].

tcanta None known  
dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to about -15°C[200].

## 6.2.124 Amelanchier huroensis

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 6 m hkuc  
hminhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier huroensis is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is rich in iron and copper[226].

tcanta None known  
dwatta None known  
propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring -

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. This species is somewhat less easy in cultivation than most other mints. It can be lost over winter if the weather is very cold or wet so ensure that it is grown in a warm, well-drained sunny position[K]. A sterile hybrid, the result of a cross between *M. arvensis* and *M. spicata*, though it can back-cross with its parents. There are some named varieties[183], most of which have variegated leaves. A polymorphic species[200]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. The whole plant has a strong minty aroma with a hint of ginger[245]. The flowers are very attractive to bees and butterflies. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.220 Mahonia nervosa

Oregon Grape, Cascade barberry  
5 tlin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.6 m hkuc  
pcimhminhtut cyutli kyuctcup hwicli hyishrasjlutnykfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Mahonia nervosa is an evergreen Shrub growing to 0.6 m (2ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from February to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[2, 3, 101]. An acid flavour but it is rather nice raw, especially when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. Too acid for most tastes but they are very good in jams, jellies, pies etc[183]. They can also be used to enhance the flavour of bland fruits or made into a refreshing lemon-flavoured drink[183]. The fruit is about 8mm in diameter[200]. Young tender leaves - cooked. Simmered in a small amount of water and eaten as a snack[183].

tcanta DyeA yellow dye is obtained from the inner bark of the stem and roots[98, 101, 257]. Dark green, violet and dark blue-purple dyes are obtained from the fruit[168]. A green dye is obtained from the leaves[168]. Plants can be grown as a ground cover, spaced about 30cm apart each way[208]. They are very slow to spread[208] and so will need weeding for their first few years after planting[K].

dwatta Antiarthritic Antibacterial Antitumor Blood tonic Dysentery Laxative TonicThe root is alterative and tonic[4]. It improves the digestion and absorption and is recommended in the treatment of psoriasis, syphilis and impure blood conditions[4, 257]. A decoction of the peeled and chopped root bark has been used as a wash in treating arthritis and as an eyewash for red itchy eyes[257]. The fruit is an

excellent safe and gentle laxative[257]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta An easily grown plant, it thrives in any good garden soil[11, 200] but also succeeds in poor dry ones. Another report says that it is best on a lime-free soil[182]. Grows well in heavy clay soils. Prefers a sunny position[3] but succeeds in heavy woodland shade[K]. Hybridizes freely with other members of this genus. Plants are growing and fruiting well at Wakehurst Place in Sussex, but they do not generally do well in Britain[11]. Resistant to honey fungus[88].

## 6.2.221 Lactuca sativa crispa

Cutting Lettuce  
5 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.9 m hkuc  
hminhtut cyutli tcup hwicli hrasjlut hpa7tli prikliwis hpa7tmwatli fyfxre7t hjonli

drutta Lactuca sativa crispa is a ANNUAL/BIENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Leaves - raw or cooked[7, 37]. A mild slightly sweet flavour with a crisp texture, lettuce is a very commonly used salad leaf and can also be cooked as a potherb or be added to soups etc[183]. This variety forms a loose rosette of leaves and can be harvested on a cut and come again basis. Seed - sprouted and used in salads or sandwiches[183]. An edible oil is obtained from the seed[7]. The seed is very small, extraction of the oil on any scale would not be very feasible[K].

tcanta Parasiticide[178]. No further details are given, but it is probably the sap of flowering plants that is used. The seed is said to be used to make hair grow on scar tissue[218].

dwatta The whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. The cultivated lettuce does not contain as much lactucarium as the wild species, most being produced when the plant is in flower[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never

kcakta Leaves - raw or cooked[7, 37]. A mild slightly sweet flavour with a crisp texture, lettuce is a very commonly used salad leaf and can also be cooked as a potherb or be added to soups etc[183]. The plant forms a head of leaves in a similar way to cabbages. The whole head is usually harvested at one time. Seed - sprouted and used in salads or sandwiches[183]. An edible oil is obtained from the seed[7]. The seed is very small, extraction of the oil on any scale would not be very feasible[K].

tcanta Parasiticide[178]. No further details are given, but it is probably the sap of flowering plants that is used. The seed is said to be used to make hair grow on scar tissue[218].

dwatta The whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. The cultivated lettuce does not contain as much lactucarium as the wild species, most being produced when the plant is in flower[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. The seed is anodyne and galactagogue[218]. Lettuce has acquired a folk reputation for an anaphrodisiac, anodyne, carminative, diuretic, emollient, febrifuge, hypoglycaemic, hypnotic, narcotic, parastictic and sedative[218].

propta Seed - sow a small quantity of seed in situ every 2 or 3 weeks from March (with protection in cooler areas) to June and make another sowing in August/September for a winter/spring crop. Only just cover the seed. Germination is usually rapid and good, thin the plants if necessary, these thinnings can be transplanted to produce a slightly later crop (but they will need to be well watered in dry weather). More certain winter crops can be obtained by sowing in a frame in September/October and again in January/February.

nwatta Prefers a light sandy loam[1]. Succeeds in most well-drained, humus-rich soils but dislikes acid conditions[1, 16]. Plants strongly dislike dry conditions, quickly running to seed in such a situation. Early and late sowings are best in a sunny position, but summer crops are best given a position with some shade in order to slow down the plants tendency to go to seed and to prevent the leaves becoming bitter[18, 20]. The garden lettuce is widely cultivated in many parts of the world for its edible leaves and is probably the most commonly grown salad plant. This is the heading form of lettuce, including the Iceberg and Butterhead varieties. There are many named varieties[183] capable of providing fresh leaves throughout the year if winter protection is given in temperate areas. Lettuces are quite a problematic crop to grow. They require quite a lot of attention to protect them from pests such as slugs, aphids and birds. If the weather is hot and dry the plants tend to run very quickly to seed, developing a bitter flavour as they do so. In wet weather they are likely to develop fungal diseases. In addition, the seed needs to be sown at regular intervals of 2-3 weeks during the growing season in order to provide a regular supply of leaves. Lettuces make a good companion plant for strawberries, carrots, radishes and onions[18, 20, 201]. They also grow well with cucumbers, cabbages and beetroot[201].

## 6.2.218 *Triteleia peduncularis*

Longray Tripletilly, Long-ray brodiaea  
5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc

htut cyutli kyuctcup hwicli hrasljut hpa7li flatprikwis hpa7tmwatli xre7t hjonli

drutta *Triteleia peduncularis* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[105, 161]. Rich in starch, the bulb can be used like potatoes.

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Alternatively, the seed can be sown in spring in a cold frame. Germination usually takes place within 1 - 3 months at 15°C. Sow the seed thinly so that there is no need to prick them out and grow the seedlings on in the pot for their first year. Give an occasional liquid feed to ensure that they do not become mineral deficient. Seedlings are prone to damping off so be careful not to overwater them and keep them well ventilated. When they become dormant, pot up the small bulbs placing about 3 in each pot. Grow them on in the greenhouse for another year or two until the bulbs are about 20mm in diameter and then plant them out into their permanent positions when they are dormant in the autumn. Division of flowering size bulbs in autumn. Dig up the clumps of bulbs, replanting the larger ones direct into their permanent positions. It is best to pot up the smaller ones and grow them on in a greenhouse for a year before planting them out when they are dormant in early autumn.

nwatta Requires a rich well-drained sandy loam[1]. Likes plenty of moisture whilst in growth followed by a warm dry period in late summer and autumn[200].

## 6.2.219 *Mentha x gracilis*

Ginger Mint

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutkyfrip hpa7li flatprikwis hpa7tmwatli xre7t hjonli

drutta *Mentha x gracilis* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. They are used as a flavouring in salads or cooked foods[61, 105]. A refreshing odour and taste[183], they are said to go particularly well with melon, tomatoes and fruit salads[238]. The slight ginger scent make them an interesting addition to fresh salads[244]. A herb tea is made from the leaves. An essential oil from the leaves is used as a spearmint flavouring, it is especially used in N. America in chewing gums[183, 238].

tcanta Essential Repellent StrewingThe essential oil obtained from the leaves has a spearmint flavour and is used commercially in N. America[238]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Antiseptic Carminative FebrifugeGinger mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of the country. The following notes are based on the general needs of the genus. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main drawback to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 6.2.125 *Crataegus aprica*

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 6 m hkuc  
hmimhtut cyutli hgatyuctcuphja7n hwicli hrasljutnyikfrip hpa7li flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Crataegus aprica* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A good dessert fruit, it is sweet and rather juicy[82]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. The fruit is about 12mm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them out in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but

undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 6.2.126 *Phyllostachys flexuosa*

Zig-Zag Bamboo, Drooping timber bamboo  
5 tin 9 cyuc 3 kcaak 2 tcan 0 dwat 6 m hkuc  
hmim cyutli tcup hwicli hrasljutnyik hpa7li flatprikwis hpa7tmwatli xre7t hjonli

drutta *Phyllostachys flexuosa* is an evergreen Bamboo growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked[25, 61, 105, 177]. A delicious flavour[266]. Slightly acrid raw, they are usually boiled in at least one change of water and added to salads etc[183]. The canes are about 10mm in diameter[K]. The shoots, which are generally 2-4cm in diameter, though occasionally up to 7cm[266], are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta Basketry WoodThe canes are not of the highest quality but can be used for plant supports etc. The medium quality wood is good for all standard bamboo uses for canes of this size[195]. The culms are used as handles of tools[266]. The splints made from the stems are used for weaving articles[266].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position[200] and plenty of moisture in the growing season[11]. A very hardy plant, tolerating temperatures down to about -17°C. According to another report the plant only suffers minor leaf damage at -22°C[195]. The plants dislike prolonged exposure to hard frosts[200]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. A plant at Trebah gardens in Cornwall was flowering heavily in May 1995[K]. This is a good companion species to grow in a woodland because the plants are shallow

rooted and do not compete with deep rooted trees[195]. The rootstock is running[25] but not aggressively so, especially in the cooler climate of Britain[200]. New growth appears from late March[25]. This species is closely related to *P. angusta*[266]. Plants need quite a lot of space because the outer culms spread out sideways and arch over[162].

## 6.2.127 Amelanchier weigandii

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Amelanchier weigandii is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit, raw or cooked. The fruit is rich in iron and copper[226].

tcanta None known  
dwatta None known  
propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta We have very little information on this species, though it is growing well at Kew Botanical Gardens, where 8 year old plants are about 3 metres tall with multiple stems and lots of side branches[K]. They were flowering well at the end of April 1995[K]. The following notes are based on the general needs of the genus. Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

## 6.2.128 Corylus sieboldiana

Japanese Hazel, Manchurian hazel  
5 tlin 9 cyuc 3 kcaak 1 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Corylus sieboldiana* is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[183]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed[183].

tcanta OilNone known  
dwatta None known  
propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta Management: Coppice Management: Standard Regional Crop Staple Crop: Protein-oilAn easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wind tolerant[1, 11]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

## 6.2.129 Crataegomespilus dardarii

Bronvaux Medlar  
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Crataegomespilus dardarii* is a deciduous Tree growing to 5 m (16ft) by 3.5 m (11ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. There are three distinct sizes of fruit on this tree, though they all have the same flavour[K]. The first is quite large, up to 35mm in diameter, and is just like the medlar, *Mespilus germanica*. The second is slightly smaller, perhaps 25mm in diameter, and once more like a medlar. The third is rather smaller, perhaps 10mm in diameter, and is intermediate between the medlar and the hawthorn, *Crataegus* spp. The fruit does not ripen until very late in the autumn, or even early winter. It will probably need to be harvested before it is fully ripe and stored in a cool but frost-free place where it can continue the ripening process. It is ready to eat when the flesh has turned brown and is very soft. It will then have a delicious, sweet flavour that reminds you of a lush tropical fruit. Care must be taken that the fruit is eaten no later than this stage because it is almost at the point of rotting and will then cause gastric upsets[K].

tcanta None known  
dwatta None known  
propta Seed - this species is a bi-generic graft hybrid and is very unlikely to breed true from seed. Should you want to give it a try, then the seed is best sown as soon as it is ripe in the autumn in a cold frame. Some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be stratified for 3 months at 15°C and then for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are

in their first year. The runners can be planted out direct into their permanent positions.

nwatta Prefers a fertile, well-drained, moisture retentive soil in a sunny position[200]. Tolerates semi-shade though fruit production will be reduced when plants grow in such a position. This species is closely related to *F. vesca*[200]. Plants are sometimes dioecious. In this case, male and female plants will be needed if fruit and seed is required.

## 6.2.215 Viola canina

Dog Violet  
5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Viola canina* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: TeaY-oung leaves and flower buds - raw or cooked[105, 177]. When added to soups, they thicken them in much the same way as okra[85, 159]. A tea can be made from the leaves[85].

tcanta None known  
dwatta Cathartic EmeticThe flowers and leaves are powerfully cathartic and emetic[4]. The plant has also had a reputation for curing skin diseases[4].

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Prefers a cool moist well-drained humus-rich soil in partial or dappled shade and protection from scorching winds. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159].

## 6.2.216 Lactuca sativa longifolia

Cos Lettuce  
5 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Lactuca sativa longifolia* is a ANNUAL/BIENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Leaves - raw or cooked[7, 37]. A mild slightly sweet flavour with a crisp texture, lettuce is a very commonly used salad leaf and can also be cooked as a potherb or be added to soups etc[183]. A nutritional analysis is available[218]. Seed - sprouted and used in salads or sandwiches[183]. An edible oil is obtained from the seed[7]. The seed is very small, extraction of the oil on any scale would not be very feasible[K].

tcanta Parasiticide[178]. No further details are given, but it is probably the sap of flowering plants that is used. The seed is said to be used to make hair grow on scar tissue[218].

dwatta The whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. The cultivated lettuce does not contain as much lactucarium as the wild species, most being produced when the plant is in flower[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. The seed is anodyne and galactagogue[218]. Lettuce has acquired a folk reputation as an anaphrodisiac, anodyne, carminative, diuretic, emollient, febrifuge, hypoglycaemic, hypnotic, narcotic, parasiticide and sedative[218].

propta Seed - sow a small quantity of seed in situ every 2 or 3 weeks from March (with protection in cooler areas) to June and make another sowing in August/September for a winter/spring crop. Only just cover the seed. Germination is usually rapid and good, thin the plants if necessary, these thinnings can be transplanted to produce a slightly later crop (but they will need to be well watered in dry weather). More certain winter crops can be obtained by sowing in a frame in September/October and again in January/February.

nwatta Prefers a light sandy loam[1]. Succeeds in most well-drained, humus-rich soils but dislikes acid conditions[1, 16]. Plants strongly dislike dry conditions, quickly running to seed in such a situation. Early and late sowings are best in a sunny position, but summer crops are best given a position with some shade in order to slow down the plants tendency to go to seed and to prevent the leaves becoming bitter[18, 20]. The garden lettuce is widely cultivated in many parts of the world for its edible leaves and is probably the most commonly grown salad plant. This is the cos lettuce, a taller growing plant that has longer, thinner leaves and a more erect habit, it does not form a compact heart. There are many named varieties[183] capable of providing fresh leaves throughout the year if winter protection is given in temperate areas. Lettuces are quite a problematic crop to grow. They require quite a lot of attention to protect them from pests such as slugs, aphids and birds. If the weather is hot and dry the plants tend to run very quickly to seed, developing a bitter flavour as they do so. In wet weather they are likely to develop fungal diseases. In addition, the seed needs to be sown at regular intervals of 2- 3 weeks during the growing season in order to provide a regular supply of leaves. Lettuces make a good companion plant for strawberries, carrots, radishes and onions[18, 20, 201]. They also grow well with cucumbers, cabbages and beetroot[201].

## 6.2.217 Lactuca sativa capitata

Cabbage Lettuce  
5 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Lactuca sativa capitata* is a ANNUAL/BIENNIAL growing to 0.9 m (3ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.



238]. They have been used internally as an aperient in the treatment of dysentery, and as a remedy for liver and gall bladder complaints[238]. Externally, they have been used as a salve to treat burns and insect stings[238, 268]. They are considered to be virtually obsolete in modern herbalism[4, 238].

propta The seed is seldom produced in Britain[4]. If seed is obtained it would probably be best sown in a cold frame in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[4]. Very easy, it can be done successfully at almost any time of the year. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Basal cuttings in late spring[K]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, it prefers a sunny warm position[52] in a dry soil[14, 37] but thrives under most conditions[4]. Tolerates a pH in the range 5.0 to 7.6. The leaves emit a soft balsamic odour[4]. The sub-species *T. balsamita tomentosum* is called the camphor plant because of its camphor-scented foliage[238]. Plants produces lot of leaves but no flowers when grown in the shade[4], though this is an advantage when the plant is being grown for its useful leaves[200]. Alecost used to be commonly grown in the herb garden but it has fallen out of favour in recent times[4].

### 6.2.212 Barbarea verna

Land Cress, Early yellowrocket

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmihmhhtut cyutli tcup hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli fyifxre7t hjonli

drutta Barbarea verna is a BIENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees, beetles. The plant is self-fertile. Suitable for; light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: OilY-oung leaves - raw, cooked or used as a seasoning[1, 2, 33, 37, 52]. A hot, spicy watercress flavour, they are delicious in salads[183, 244]. Leaves can be obtained throughout the year if autumn-sown plants are given a light protection in winter[1]. An edible oil is obtained from the seed[46, 52, 61, 183]. The seed can be sprouted and added to salads etc[183].

tcanta OilNone known

dwatta None known

propta Seed - sow spring to September in situ at 3-weekly intervals to provide a succession of leaves. Germination usually takes place within 2 - 3 weeks.

nwatta Succeeds in sun or shade in a moist well-drained soil,[200] growing well on a north facing wall[33, 52]. The summer crop is best if it is given some shade whilst the winter crop succeeds in sunny positions[1, 200]. Land cress is often cultivated as a salad plant, when it is usually treated as an annual[46]. It can supply leaves all year round from successional sowings[1]. In hot weather plants soon run to seed unless they are kept shaded and moist[183]. The leaves taste much hotter in the summer[K]. Plants usually self-sow freely when growing in a suitable position[K].

### 6.2.213 Claytonia caroliniana

Broad-Leaved Spring Beauty, Carolina springbeauty
5 tlin 9 cyuc 3 kcaak 1 tcan 0 dwat 0.1 m hkuc

htut cyutli tcup hwicli hrasljut hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Claytonia caroliniana is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in March, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked like potatoes[2, 22, 46, 62, 85, 183, 257]. Rich in starch, it has a pleasant nutty flavour[105, K]. Leaves and stems - raw or cooked[62]. A very mild flavour, they are best mixed with stronger tasting leaves[183].

tcanta None known

dwatta None known

propta Seed - surface sow on a peat based compost in spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 10°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Division of offsets in spring or autumn.

nwatta Prefers a damp peaty soil and a position in full sun[1, 164]. Requires a lime-free soil[164]. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Ephemeral emerging in spring and dying back by summer every year [1-2]. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is a corm swelling at the stem base [1-2].

### 6.2.214 Fragaria viridis

Green Strawberry

5 tlin 9 cyuc 3 kcaak 3 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Fragaria viridis is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May, and the seeds ripen from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[74, 177]. The fruit are greenish-tinged with red and are sweet and succulent with a rich musky pineapple-like flavour[183]. Absolutely delicious, though they are not produced very freely[K].

tcanta An excellent ground cover plant, spreading vigorously by means of surface stolons and forming a dense carpet[K]. It grows well amongst shrubs but can out-compete smaller plants[K].

dwatta None known

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit

only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years. Grafting onto a rootstock of hawthorn, *Crataegus* species.

nwatta Prefers a well-drained, moisture-retentive soil enriched with organic matter, in sun or part shade[200]. Plants are hardy to about -15°c[200]. This tree is a bi-generic graft chimera resulting from a medlar, *Mespilus germanica*, being grafted on a hawthorn, *Crataegus* sp.[11]. Three branches that grew from just beneath the graft were different from each other and also from either of the two species used in the graft. They showed characteristics intermediate between the hawthorn and the medlar[11]. These three forms have been propagated and, in growth, each form tends to produce some branches of the other forms[11]. The first branch that was propagated has received specific status as *C. dardarii*. This is closer to the medlar than the hawthorn, but produces its flowers in clusters like the hawthorn - the fruits are medlar-like but a bit smaller. This tree also produces some branches that are pure medlar[11]. The second branch has cultivar status as 'Jules d'Asnieres'. This is more hawthorn-like, and produces some hawthorn-like spines. It produces fruit that is more hawthorn in size[11]. The third branch, which does not seem to have been named, started off like a pure hawthorn, but towards its extremity changed into the cultivar 'Jules d'Asnieres'[11].

### 6.2.130 Vaccinium formosum

Swamp Highbush Blueberry, Southern blueberry
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium formosum is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 142]. Well-flavoured[200]. A reasonable size, 7 - 12mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Often cultivated for its edible fruit[142], there are many named varieties[1]. Spreading by means of suckers, plants often form small colonies[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.131 Pleioblastus simonii

Medake, Simon bamboo

5 tlin 9 cyuc 3 kcaak 4 tcan 0 dwat 4.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Pleioblastus simonii is an evergreen Bamboo growing to 4.5 m (14ft 9in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Seed Shoots StemEdible Uses: Young shoots - cooked[25, 61, 105]. They have a very bitter flavour, this bitterness is considerably reduced by changing the water at least once during the cooking process - though this will also remove quite a few of the nutrients[K]. The new shoots are about 20mm in diameter[K]. Seed cooked. As a grass seed the paper husk must be removed before eating.

tcanta Hedge Hedge Plant support WoodCanes are thin walled but extremely strong, they can be used as plant supports, also for fencing etc[25, 61, 74, 195]. Often used in China for making fan handles, poles and in various handicrafts[195]. Tolerant of maritime exposure and very hardy and vigorous, this plant makes a good screen or hedge[25, 166, 195].

dwatta None known

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°c. Stored seed should be sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse or cold frame until they are large enough to plant out, which could be a number of years. The plants only flower at intervals of several years and so seed is rarely available. Division in spring as new growth commences. Very easy, single canes can be used. Pot them up in light shade in a greenhouse. Make sure the foliage is not allowed to dry out - misting 2 - 3 times a day for the first couple of weeks following division can be very helpful. Plant out in the summer once they are growing away strongly.

nwatta A very easily grown bamboo, it succeeds in most soils but prefers a good loamy soil in sun or semi-shade[1]. Dislikes drought[1]. Tolerates maritime exposure[166]. A very hardy plant, it can tolerate temperatures down to between -20 and -25°c. The rootstock is running and very invasive[11, 25, 166]. Another report says that it is a vigorous grower but not invasive[195]. New shoots are produced from May[25]. The canes are harvested commercially for their many uses in Japan[195]. It is the third most commonly cultivated species in Japan[195]. This species is notably resistant to honey fungus[200]. Unlike many bamboos, this plant quite often flowers and sets viable seed, the plants do not usually die as a result of this[122]. However, if they are fed with artificial NPK fertilizers at this time they are far less likely to survive[122].

### 6.2.132 Staphylea pinnata

Bladder Nut

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 4.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Staphylea pinnata is a deciduous Shrub growing to 4.5 m (14ft) by 4.5 m (14ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw[2, 105, 177]. Said to taste like pistachios, the seeds are eaten by children in Germany[183].

tcanta None known

dwatta None known

propta Seed - this can be very slow to germinate, sometimes taking 18 months or more. It is best sown as soon as it is ripe in a cold frame[200], and some of it at least should then germinate in the spring. Stored seed should be sown as early in the year as possible and given cold stratification - it might not germinate until spring of the following year. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first winter. Plant them out early the following summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Fair to good percentage[78]. Layering in July/August. Takes 15 months. Good percentage[78]. Plants sometimes produce suckers, these can be removed in the dormant season and planted out.

nwatta Tolerant of a wide range of soils so long as they are not too dry[11, 182, 200], it prefers a rich loamy soil in full sun or semi-shade[200]. Prefers a neutral to acid soil but tolerates some alkalinity[202]. A very ornamental plant[1], it is hardy to about -20°C[184]. The plants flower best in years that follow hot summers[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.133 Zanthoxylum simulans

Szechuan Pepper, Chinese-pepper, Prickly Ash  
5 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 4 m hkuc  
pcimhmihmtut cyutli tcup hwicli hrasljutnyik hpa7tli flat-prikkwis hpa7tmwatli nyanhjen hjonli

drutta Zanthoxylum simulans is a deciduous Shrub growing to 4 m (13ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe fruit is dried and used as a condiment[46, 61, 105, 177]. A pepper flavour, it is stronger and more pungent than black pepper[183]. It can be used whole or ground into a powder and used as a table seasoning[183]. A light roasting brings out more of the flavour[206]. It is an ingredient of the famous Chinese 'five spice' mixture[206].

tcanta None known

dwatta Anodyne Anthelmintic Antidote Antiphlogistic Astringent Carminative Diaphoretic Digestive Diuretic Emmenagogue Stimulant Stomachic Tonic VasodilatorAstringent, diaphoretic, emmenagogue[116, 178]. The pericarp is anaesthetic, diuretic, parasiticide and vasodilator[176]. It is used in the treatment of gastralgia and dyspepsia due to cold with vomiting, diarrhoea, abdominal pain, ascariasis and dermal diseases[176]. It has a local anaesthetic action and is parasiticide against the pork tapeworm (*Taenia solium*)[176]. The pericarp contains geraniol. In small doses this has a mild diuretic action, though large doses will inhibit the excretion of urine[176]. There is a persistent increase in peristalsis at low concentration, but inhibition at high concentration[176]. The leaves are carminative, stimulant and sudorific[147, 218]. The fruit is carminative, diuretic, stimulant, stomachic and tonic[147, 218]. The seed is antiphlogistic and diuretic[218]. A decoction of the root is digestive and also used in the treatment of snakebites[218]. The resin contained in the bark, and especially in that of the roots, is powerfully stimulant and tonic[82].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may require up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, re-

moved in late winter and planted into their permanent positions[113].

nwatta Landscape Uses:Border, Massing. Easily grown in loamy soils in most positions, but prefers a good deep well-drained moisture retentive soil in full sun or semi-shade[1, 11, 200]. A plant has been growing well for many years in deep woodland shade at Cambridge Botanical gardens, it was fruiting heavily in autumn 1996[K]. Cultivated for its seed, which is used as a condiment in China[46, 61]. Flowers are formed on the old wood[206]. The bruised leaves are strongly aromatic[245]. Dioecious. Male and female plants must be grown if seed is required. Special Features:Inconspicuous flowers or blooms, Blooms appear periodically throughout the year.

### 6.2.134 Viburnum nudum

Smooth Withe Rod, Possumhaw, Withe-rod, Swamp Haw, Smooth Witherod, Possum Haw Viburnum, Possum Haw  
5 tin 9 cyuc 3 kcaak 0 tcan 1 dwat 4.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprikkwis hpa7tmwatli dyatre7t hjonli

drutta Viburnum nudum is a deciduous Shrub growing to 4.5 m (14ft 9in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 105]. It usually has a sweetish flavour[2, 183] but is sometimes bitter[43] and is usually unpalatable[227]. The ovoid fruit is about 8mm long and contains a single large seed[200].

tcanta None known

dwatta Antispasmodic Diuretic TonicA tea made from the bark is antispasmodic, diuretic, tonic and uterine sedative[222].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants often grow in quite acid soils in the wild[227]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. This species is closely related to *V. cassinoides*[11]. Special Features: Attracts birds, North American native, Wetlands plant, Fragrant flowers, Attractive flowers or blooms.

the ground seed), poultices or added to the bath water. It is used in the treatment of respiratory infections, arthritic joints, chilblains and skin eruptions etc[238]. At a ratio of 1:3, the seed has an inhibitory action on the growth of fun-gus[176]. Care should be exercised in using this remedy because the seed contains substances that are extremely irritant to the skin and mucous membranes[238]. The leaves are carminative[218].

propta Seed - sown in situ from early spring to late summer. Germination takes place in less than a week. The earlier sowings are for a seed crop, the later sowings are for edible leaves and green manure[82]. When sowing seed for use in mustard and cress, the seed is soaked for about 12 hours in warm water and then placed in a humid position. Traditionally, it is sown in a tray on a thin layer of soil, or on some moist blotting paper, and the tray is placed in a warm dark place for a few days to encourage rapid and rather etiolated growth. The seedlings can then be placed in a lighter position for a couple more days to turn green before being eaten. The mustard seed should be sown about 3 - 4 days later than the cress for them both to be ready at the same time[264].

nwatta Prefers a light well-drained soil[52]. Succeeds on most soils when growing in a sunny position[238]. For best production, it requires high nutrient soils with a high level of nitrogen, but it may be grown on a wide range of soils from light to heavy, growing best on relatively heavy sandy loamy soils[269]. It is not suited to very wet soils[269]. White mustard grows best where the annual precipitation varies from 35 to 179cm, annual temperature from 5.6 to 24.9°C and pH from 4.5 to 8.2[269]. White mustard is a quick-growing long-day annual which prefers temperate climates with some humidity. It is sometimes cultivated, both in the garden and commercially, for its edible seed[4, 183]. The plant can withstand high temperatures, but very hot days during flowering and ripening may reduce seed setting and lower quality of seed[269]. There are some named varieties[183]. It is a very fast growing plant, but requires plenty of moisture for optimum growth[87]. Seed yields are usually a bit less than 1 tonne per hectare, though experimental plantings have suggested that up to 8 tonnes per hectare is possible[269]. White mustard is sometimes also grown as a seed sprout, usually with cress seeds (*Lepidium sativum*) to supply mustard and cress. This is a mixture of the two types of sprouted seeds, used when about 7 - 10 days old[K]. The mustard seed should be sown three days before the cress seed[238]. The plant is not very deep rooted[87], it self-sows freely when in a suitable site[14].

### 6.2.210 Lactuca sativa angustana

Celluce  
5 tin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli prikkwis hpa7tmwatli fyifxre7t hjonli

drutta Lactuca sativa angustana is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves StemEdible Uses: Leaves - raw or cooked[33, 183]. A mild, slightly sweet flavour, they are rather more coarse than ordinary lettuce[206], though they make an acceptable ingredient in mixed salads. Old leaves become coarser and bitter[206]. Stem - raw or cooked. Thick, tender, crisp and juicy, its flavour is variously described as being like lettuce, celery, artichoke, squash, asparagus or chard[33, 183]. It is usually peeled before being used[183, 206]. The stems can be harvested just before the plants flower without them turning bitter, though they might become hollow at this stage[206].

tcanta ParasiticideParasiticide[178]. No further details are given, but it is probably the sap of flowering plants that is used. The seed is said to be used to make hair grow on scar tissue[18].

dwatta Anodyne Antispasmodic Emollient Expectorant Parasiticide SedativeThe whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries

when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. The cultivated lettuce does not contain as much lactucarium as the wild species, most being produced when the plant is in flower[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. The seed is anodyne and galactagogue[218]. Lettuce has acquired a folk reputation as an anaphrodisiac, anodyne, carminative, diuretic, emollient, febrifuge, hypoglycaemic, hypnotic, narcotic, parasiticide and sedative[218].

propta Seed - sow March to June in situ[206]. Seedlings can be transplanted[206]. Seed becomes dormant at temperatures above 27°C[206].

nwatta Prefers a light sandy loam[1]. Succeeds in most well-drained, humus-rich soils but dislikes acid conditions[1, 16]. Prefers some shade in the summer to slow down the plants tendency to go to seed and to prevent the leaves becoming bitter[18, 20]. Plants can resist some frost, they can also tolerate temperatures in excess of 27°C[206]. They are fairly resistant to bolting, though they can run to seed prematurely in very hot conditions[206]. The celtuce is a form of lettuce with a longer and thicker central stem, it is sometimes cultivated for its edible leaves and stems[206]. There are some named varieties[183]. It takes 3 - 4 months from sowing before the stems are ready to harvest[206]. A surface-rooting plant, the roots can be damaged by hoeing[206]. A good companion for strawberries, carrots, radishes and onions[18, 20].

### 6.2.211 Tanacetum balsamita

Alecost, Costmary  
5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.9 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasljutnyik hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

drutta Tanacetum balsamita is a PERENNIAL growing to 0.9 m (3ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or used as a flavouring in soups, beer etc[2, 4, 14, 27, 52, 177, 183]. They can be chopped and added sparingly to salads[183]. They have a very pleasant aroma, but can be overpowering in the food if you are not careful[K]. The leaves were at one time widely used in brewing beer, before being superseded by hops (*Humulus lupulus*)[238]. The whole leaves can be laid in cake trays to flavour the cake whilst it is baking[183]. The flower petals are used for conserves[183]. A delicious tea is made from the dried leaves[14, 21, 183].

tcanta InsecticidePot-pourri StrewingThe plant was traditionally used for its insecticidal properties[200]. The dried leaves retain their fragrance well and so are used in pot-pourri[4, 238], they are also used as a strewing herb[200].

dwatta Antiseptic Astringent Digestive Dysentery LaxativeAlecost is seldom used in herbal medicine, though it does have a beneficial effect upon the digestive system[268]. The leaves are antiseptic, astringent, digestive and laxative[4, 14,

and is pollinated by Flies, bees, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Flowers Leaves**Edible Uses:** Young leaves - raw or cooked like spinach[2, 9, 27, 46, 52, 95]. A hot cress-like flavour[183]. Young leaves are chopped up finely and added to salads, older leaves can be used as a potherb but they are rather strong and are best cooked in one or two changes of water[183]. The leaves are available all year round, even in the winter, especially if the weather is mild[95, 115]. To increase the productivity of the plants, remove the flowering stems as they appear (they can be eaten like the leaves[K]) and pick the outer leaves as the plant re-grows[244]. Some caution is advised, see the notes above on toxicity. Young flowering stems - harvested before the flowers open and cooked like broccoli[183].

**tcanta None known**

**dwatta Antiscorbatic Appetizer Diuretic Vulnerary**The leaves are vulnerary and have been used as a poultice for treating wounds[207, 240]. A tea made from the leaves is appetizer, antiscorbatic and diuretic[222].

**propta Seed** - sow spring or autumn in situ. Germination usually takes place within 2 - 3 weeks. Division in spring. his plant is a short-lived perennial, and also usually self-sows freely, so we have not found division to be worthwhile.

**nwatta Succeeds** in sun or shade in a moist well-drained soil[1, 111]. Tolerates a pH in the range 4.8 to 7.5. The plant can continue to grow all winter, especially if the weather is mild[183]. A short-lived perennial[1], though plants usually self-sow freely when in a suitable position[K]. There is at least one named form, developed for its ornamental value. 'Variegata' has variegated leaves and grows less strongly than the type[183]. A good bee plant[108].

## 6.2.208 Geum urbanum

Wood Avens, Bennet's Root - Old man's whiskers, Herb ben-net

5 tlin 9 cyuc 3 kcaak 2 tcان 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

**drutta Geum urbanum** is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Leaves Root**Edible Uses:** Condiment DrinkYoung leaves - cooked. Root - cooked. Used as a spice in soups, stews etc. and also as a flavouring in ale[4, 5, 8, 13, 183]. It is a substitute for cloves with a hint of cinnamon in the flavour[12, 74, 183]. It is best used in spring[12]. The root is also boiled to make a beverage[161]. The root is up to 5cm long[4].

**tcanta Repellent Tannin**The freshly dug root has a clove-like fragrance[4], when dried it is used in the linen cupboard to repel moths[4, 53]. The root contains about 9% tannin[4].

**dwatta Antidiarrhoeal Antiinflammatory Antiseptic Aromatic Astringent Diaphoretic Febrifuge Skin Stomachic Styptic TonicWood avens** is an astringent herb, used principally to treat problems affecting the mouth, throat and gastrointestinal tract. It tightens up soft gums, heals mouth ulcers, makes a good gargle for infections of the pharynx and larynx, and reduces irritation of the stomach and gut[254]. All parts of the plant, but especially the root, are anti-inflammatory, antiseptic, aromatic, astringent, diaphoretic, febrifuge, stomachic, styptic and tonic[4, 9, 21, 165, 238]. An infusion is taken internally in the treatment of diarrhoea, intestinal disorders, stomach upsets, irritable bowel syndrome and liver disorders, it is also applied externally as a wash to haemorrhoids, vaginal discharges etc[238, 254] and to treat various skin affections - it is said to remove spots, freckles and eruptions from the face[4, 9]. The root is best harvested in the spring, since at this time it is most fragrant[4]. Much

of the fragrance can be lost on drying, so the root should be dried with great care then stored in a cool dry place in an airtight container, being sliced and powdered only when required for use[4]. The powdered root had a great reputation as a substitute for quinine in the treatment of intermittent fevers [301].

**propta Seed** - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer' Division in spring or autumn. This should be done every 3 - 4 years in order to maintain the vigour of the plant[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** Easily grown in any moderately good garden soil that is well-drained[1]. Prefers shade[12, 21] and a soil rich in organic matter[200]. This species was widely cultivated as a pot-herb in the 16th century[5]. The bruised or dried root is pleasantly aromatic with a clove-like fragrance[245]. Plants self-sow freely when well-sited[238]. Hybridizes freely with other members of this genus[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.209 Sinapis alba

White Mustard

5 tlin 9 cyuc 3 kcaak 0 tcان 3 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

**drutta Sinapis alba** is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Leaves Oil Seed**Edible Uses:** Condiment OilLeaves - raw or cooked[2, 5, 14, 52]. A hot pungent flavour, especially if eaten raw[K]. Young leaves are used as a flavouring in mixed salads, whilst older leaves are used as a potherb[183]. Seed - sprouted and eaten raw[1, 34, 37, 52]. The seed takes about 4 days to be ready[244]. A hot flavour, it is often used in salads. A nutritional analysis is available[218]. The seed can be ground into a powder and used as a food flavouring[17, 34, 89, 171], it is the 'white mustard' of commerce[100, 105]. This is milder than the black mustard obtained from *Brassica nigra*[183]. The pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238].

**tcanta Green manure Oil**The seed contains up to 35% of a semi-drying oil[74]. It is used as a lubricant and for lighting etc[21, 46, 57, 61]. The plant can be grown as a green manure crop[17, 89]. It is very fast growing, producing a good bulk in just a few weeks from seed, but it is shallow rooted so does not do so well in dry periods[87]. It is also susceptible to all the diseases of the cabbage family such as club-root so is best avoided if this is likely to be a problem[17].

**dwatta Antibacterial Antifungal Antirheumatic Appetizer Carminative Cathartic Diaphoretic Digestive Diuretic Emetic Expectorant Rubefacient Stimulant Vesicant**The seed is antibacterial, antifungal, appetizer, carminative, diaphoretic, digestive, diuretic, emetic, expectorant, rubefacient and stimulant[14, 176, 218, 238]. The seed has a cathartic action due to hydrolytic liberation of hydrogen sulphide[218]. In China it is used in the treatment of coughs with profuse phlegm and tuberculosis, pleurisy[176]. The seed is seldom used internally as a medicine in the west[238]. Externally it is usually made into mustard plasters (using

## 6.2.135 Zanthoxylum alatum

Winged Prickly Ash

5 tlin 9 cyuc 3 kcaak 3 tcان 2 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

**drutta Zanthoxylum alatum** is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Edible Uses: CondimentThe seed is ground into a powder and used as a condiment[183]. A pepper substitute, it is widely used in the Orient[105, 132, 158, 183]. A light roasting brings out more of the flavour[206]. The seed is an ingredient of the famous Chinese 'five spice' mixture[206]. The fruit is rather small but is produced in clusters which makes harvesting easy[K]. Each fruit contains a single seed. Young leaves are used as a condiment[105, 158, 183].

**tcanta Miscellany Teeth Wood**The fruit contains 1.5% essential oil[240]. The fruit is used to purify water[146, 158]. Toothbrushes are made from the branches[146, 158]. Wood - heavy, hard, close grained. Used for walking sticks[146, 158].

**dwatta Cholera Miscellany Odontalgic Stimulant Stomachic Tonic**The seeds and the bark are used as an aromatic tonic in the treatment of fevers, dyspepsia and cholera[240]. The fruits, branches and thorns are considered to be carminative and stomachic[46, 61, 146, 158, 240]. They are used as a remedy for toothache[240].

**propta Seed** - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may require up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, removed in late winter and planted into their permanent positions[113].

**nwatta** Prefers a good deep well-drained moisture retentive soil in full sun or semi-shade[1, 11, 200]. This species is closely related to *Z. planispinum*[200]. Flowers are formed on the old wood[206]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.136 Quercus coccifera

Kermes Oak

5 tlin 9 cyuc 3 kcaak 3 tcان 2 dwat 4 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

**drutta Quercus coccifera** is an evergreen Shrub growing to 4 m (13ft) by 4 m (13ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year; in flower from April to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**ckakta Edible Parts:** Seed**Edible Uses:** CoffeeSeed - cooked[2, 63, 105]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in

a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

**tcanta Dye Repellent Tannin Wood**A mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are ex-crescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The bark is rich in tannin[148]. A black dye can be obtained from the bark[89] and also from the seeds[148].

**dwatta Astringent Dysentery**Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

**propta Seed** - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

**nwatta** Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. A very ornamental plant[1], it thrives in Britain[200]. A shrub growing in dappled woodland shade at Cambridge Botanical Gardens produced a few ripe seeds after the hot summer of 1989, though the vast majority of seeds were aborted[K]. The fruit ripens in its second year[11]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Any transplanting should be done once growth has commenced in late May or in September[11]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200].

## 6.2.137 Viburnum cotinifolium

5 tlin 9 cyuc 3 kcaak 3 tcان 0 dwat 3.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli dyatxre7t hjonli

**drutta Viburnum cotinifolium** is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[2, 51, 146, 158]. A sweetish flavour[183]. The ooid fruit is about 12mm long and contains a single large seed[200].

**tcanta Wood**Wood - hard, close grained[146, 158].

**dwatta None known**

**propta Seed** - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possi-

ble, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Hardy to about -15°C[184]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Closely allied to *V. lanтана*[1, 11], but not as hardy as that species[11].

### 6.2.138 *Prunus canescens*

Greyleaf Cherry  
5 tin 9 cyuc 3 kcaak 2 tcan 1 dwat 3 m hku  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Prunus canescens* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[183]. A pleasant cherry-like flavour[11]. The fruit is about 10mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye RootstockUsed as a rootstock for cherries. It is compatible with most sweet cherry cultivars and produces small trees with an open growth habit. Suitable for planting at 300 - 500 trees per hectare. The fruit yield tends to be very good[183]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil, growing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.139 *Sambucus racemosa* var. *racemosa*

Red Coast Elder  
5 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 3 m hku

hmmihmtt cyutli tcup hwicli hrasjlutnyikri hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Sambucus racemosa* var. *racemosa* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Fruit - raw or cooked[61, 105, 257]. The fruit can be made into jams and preserves[257]. It can also be dried for winter use[118]. The fruit is about 5mm in diameter and is borne in large clusters[200]. Some caution is advised, see notes above on toxicity. Flowers - raw or cooked.

tcanta None known  
dwatta The leaves are abortifacient, analgesic, oxytocic and poultice[257]. A decoction of the leaves has been used to terminate a pregnancy and can also be taken during labour to ease the birth[257]. An infusion of the leaves has been used as an antiseptic wash on areas affected by blood poisoning[257]. A poultice of the pounded leaves has been applied to abscess and boils and also to sore joints to help reduce the swelling[257]. A poultice of the cooked shoots has been used to alleviate pain[257]. The bark is cathartic[257]. An infusion of the bark has been used in the treatment of coughs and colds[257]. A poultice of the bark has been applied to sore joints to help reduce the swelling[257]. The fruit has been cooked and eaten as a treatment for stomach problems[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.140 *Viburnum dilatatum*

Linden Viburnum, Linden arrowwood  
5 tin 8 cyuc 3 kcaak 2 tcan 1 dwat 3 m hku  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli dyaxre7t hjonli

drutta *Viburnum dilatatum* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105, 177, 179]. A sweet flavour[178]. The ovoid fruit is about 8mm long and contains a single large seed[200]. Leaves - cooked[105, 177].

tcanta FibreA fibre obtained from the inner bark is used for making ropes[178].

dwatta Anthelmintic Astringent VulneraryA decoction of the leaves is astringent and vermifuge. It is used for washing and healing maggoty sores[178, 218]. The twigs are also

ingestion can be lethal whilst skin contact can cause dermatitis[222, 238].

propta Seed - sow in situ in spring or autumn[169].

nwatta Prefers a sunny position in a well-drained acidic soil of low to moderate fertility[169]. Another report says that it prefers a rich sandy soil in sun or partial shade[238]. The plants neat habit and aromatic foliage make it a good candidate for growing in containers or planting near seats[238].

### 6.2.205 *Mentha requienii*

Corsican Mint, Mint

5 tin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.1 m hku  
hmmihmtt cyutli tcup hwicli hrasjlutnyikri hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Mentha requienii* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. A very strong peppermint-like aroma, it is used as a flavouring in salads, cooked foods and liqueurs[183]. A herb tea is made from the leaves.

tcanta Essential Repellent StrewingAn essential oil with a strong peppermint scent is obtained from the whole plant. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. An ornamental ground cover plant[183].

dwatta Antiseptic Carminative FebrifugeA tea made from the leaves of most mint species has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Reaching only 1-3 cm in height. Succeeds in most soils and situations so long as the soil is not too dry[200]. This species of mint will grow in drier soils than the other mints[245]. It also grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Prefers a shady position[188]. Fairly tolerant of being walked on, it grows well in the cracks of paving stones and also as a lawn with thyme and camomile[245]. This species is not hardy in all areas of Britain[238]. However, the plant usually self-sows even when the parent plant is killed by frost[238]. The whole plant is strongly aromatic with a peppermint aroma[245]. The flowers are very attractive to bees and butterflies. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests. Members of this genus are rarely if ever troubled by browsing deer[233]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the

number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 6.2.206 *Allium acuminatum*

Hooker's Onion, Tapertip onion  
5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.3 m hku  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Allium acuminatum* is a BULB growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Leaves Root SeedEdible Uses: Bulb - raw or cooked[105, 177]. Eaten in spring and early summer[161]. A strong flavour[257]. The bulb is 10 - 15mm wide[200]. Leaves - raw or cooked. Used as a relish[257]. Flowers - raw. Used as a garnish on salads. The seed heads can be placed in hot ashes for a few minutes, then the seeds extracted and eaten[257].

tcanta RepellentThe growing plant is said to repel insects and moles[20]. The bulbs can be rubbed on the skin to repel insects[257].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs tend to rot when grown in cool wet climates, even if they are given sharp drainage[203]. This species is best in a cold frame and given a dry summer rest[163, 203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.207 *Barbarea vulgaris*

Yellow Rocket, Garden yellowrocket  
5 tin 9 cyuc 3 kcaak 0 tcan 1 dwat 0.4 m hku  
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyfxre7t hjonli

drutta *Barbarea vulgaris* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs)

drutta Plantago coronopus is a ANNUAL/PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[2, 13, 132, 183]. High yielding[27]. One of the nicer tasting members of this genus, the leaves are fairly tender and have a slight bitterness[K]. Some people blanch the leaves in boiling water for a few seconds before using them in salads in order to make them more tender[183]. This leaf is one of the ingredients of ‘misticanze’, a salad mixture of wild and cultivated leaves that originated in the Marche region of Italy[183].

tcanta Dynamic accumulator.

dwatta Antiperiodic Laxative OphthalmicThe leaves are antiperiodic and ophthalmic. They are used as a remedy for ague and sore eyes[4]. Plantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200]. A polymorphic species[132]. This plant has sometimes been cultivated for its edible leaves[2, 52]. An important food plant for many caterpillars[30].

### 6.2.202 Cirsium foliosum

Elk thistle

5 tin 9 cyuc 3 kcaak 2 tcan 0 dwat 0.6 m hkuc

htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Cirsium foliosum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves Oil Root StemEdible Uses: OilRoot - cooked[61, 85, 105, 161]. About the size of a carrot, they are sweet and well-flavoured though require long preparation[207]. The root is likely to be rich in inulin, a starch that cannot be digested by humans. This starch thus passes straight through the digestive system and, in some people, ferments to produce flatulence[K]. Plant crown[85]. No more details are given. Stems - peeled[161]. The peeled stems are a sweet herb[207]. Tender with a sweet delicate taste[212].

tcanta OilThe seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

dwatta None known

propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°c[164]. Division in spring or autumn.

nwatta An easily grown plant, succeeding in any ordinary garden soil in a sunny position[200]. This species should tolerate wet soils[K].

### 6.2.203 Asarum splendens

Chinese Wild Ginger

5 tin 9 cyuc 3 kcaak 3 tcan 0 dwat 0.2 m hkuc

pcimhmim cyutli kyuctcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli hjonli

drutta Asarum splendens is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.6 m (2ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: A ginger-like rhizome with a strong potent flavour [1-2]. They are commonly referred to as wild gingers (not a culinary gingers) as their rhizomes have a similar spicy scent.

tcanta Groundcover - an excellent groundcover for shade and semi-shade. Known to tolerate Juglone (a poisonous product produced by black walnuts Juglans nigra)[1-2]. Attractive leaves - Containers. Ornamental. Food Forest.

dwatta None Known

propta Propagate by seed in containers in a cold frame as soon as ripe. Can also be propagated by division in early spring.

nwatta A semi-evergreen perennial with thick heart-shaped, dark green leaves. Asarum splendens is a showy, vigorous groundcover for shade with a vigorous rhizomatic root that forms a thick mat of foliage. It will remain semi-evergreen through mild winters. Semi shade to full shade. It prefers moist, slightly acidic organic soil in a well-drained site and is ideal for a shady border or a woodland garden. In China it grows on mountain slopes between 800-1,300 m above sea level. Flower Color: Purple. Bloomtime: Early Spring Foliage Color: Variegated. Resistant: Deer Resistant, Rabbit Resistant.. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. Known to tolerate Juglone (a poisonous product produced by black walnuts Juglans nigra) [1-2].

### 6.2.204 Hedeoma pulegioides

American Pennyroyal, American false pennyroyal

5 tin 9 cyuc 3 kcaak 0 tcan 3 dwat 0.3 m hkuc

hmimhtut cyutli kyuctcup hwicli hyhisrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Hedeoma pulegioides is a ANNUAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentThe leaves have a very strong mint-like aroma and taste[171], they can be brewed into a refreshing tea that promotes good digestion, or they can be used as a culinary flavouring[183, 238]. An essential oil from the plant is used by the food industry as a flavouring in beverages, ice cream, baked goods etc[183].

tcanta Essential RepellentThe essential oil is used as an ingredient in commercial insect repellents and cleaning products[238]. The plant is used as an insect repellent[169, 171]. When rubbed on the body it is said to repel ticks[207].

dwatta Abortifacient Birthing aid Carminative Diaphoretic Rubefacient StimulantAmerican pennyroyal has a long history of medicinal use by various native North American Indian tribes and has become a traditional household remedy in North America[238]. It is used mainly in the treatment of digestive disorders, colds, whooping cough, painful menstruation and as an aid in childbirth[238]. A tea made from the leaves or flowering stems is carminative, rubefacient, stimulant[46, 61, 171]. It is used to treat colds because it promotes perspiration[207]. A tea with brewers yeast can induce an abortion[213]. The plants are harvested when flowering and can be used fresh or dried[213, 238]. The essential oil is distilled from the plants when they are in flower and used medicinally in the same ways as the leaves. Caution is advised since the pure essential oil is very toxic and

vermifuge whilst the fruits are used as a vermifuge for children[218].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested ‘green’ (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. A very ornamental[1] and polymorphic species[58], there are some named varieties developed for the ornamental value of the fruit[182]. Special Features:Attractive foliage, Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.2.141 Viburnum farreri

Culver’s root, Fragrant Viburnum

5 tin 8 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum farreri is a deciduous Shrub growing to 3 m (9ft) by 2.5 m (8ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from November to February, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[11]. A sweet flavour, but the fruit is not freely borne in Britain[K].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested ‘green’ (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting

them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Hedge, Massing, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in full sun or in semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Requires shelter from N. and E. winds[200]. Plants are hardy to about -20°c[184]. A very ornamental plant[1], it flowers in the winter and the flowers are said to withstand temperatures down to -12°c without damage[11, 200]. The flowers diffuse a sweet and cloying perfume of heliotrope[245]. The fruit, however, is not often produced in this country[K]. This may be due to the plant being self-incompatible and so growing 2 or more different cultivars together may improve fruit set[11, 200]. Hand pollination may also be beneficial as well as siting the plants so that they get the maximum of protection from severe winter weather[K]. A west-facing wall or woodland edge would be ideal for this[K]. The plants flower on terminal and lateral clusters of the current years growth, any pruning is best carried out in the spring[219]. This species has long been known as V. fragrans, but this name is invalid[11]. It is closely related to V. grandiflorum[11]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.2.142 Prunus angustifolia

Chickasaw Plum, Watson’s plum, Hally Jolivetie Cherry
5 tin 9 cyuc 3 kcaak 3 tcan 1 dwat 3 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Prunus angustifolia is a deciduous Tree growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw, cooked or dried for later use[82, 149, 274]. Large and thick-skinned with a soft juicy sweet pulp, it has a delicious flavour and is very good eaten out of hand, whilst it can also be used in pies, preserves etc[183, 274]. The fruit is up to 18mm in diameter[227]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Dye Shelterbelt Soil stabilization WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. This species is sometimes used in shelterbelt planting[227]. It has an extensive root system and often forms thickets, which make it useful for erosion control[229]. Wood - heavy, rather soft, not strong[82]. It weighs 43lb per cubic foot[227] and is of little commercial value[229].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Landscape Uses:Border, Espalier, Standard, Specimen. Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Although it should be hardy in all parts of Britain, it grows better in the warmer areas of the country[11]. A fast-growing but short-lived tree in the wild[229], it has become rather rare in a truly wild state[227], though it is often cultivated for its edible fruit in N. America. There are some named varieties[82, 183]. The fruit is not freely produced in British gardens[11]. The flowers, which appear just before the leaves unfold, have a refreshing fruity scent[245]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. This species suckers freely in the wild, often forming thickets[82]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, All or parts of this plant are poisonous, Attracts butterflies, Fragrant flowers, Blooms are very showy. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 6.2.143 Berberis lycium

5 tin 9 cyuc 3 kcaak 1 tcan 3 dwat 3 m hkuc hmimhtut cyutil kyuctcup hwicli hysihrasjlutnyikfrrip hpa7tli flatprikklwis hpa7tmwatli fyfkrx7t hjonli

drutta Berberis lycium is an evergreen Shrub growing to 3 m (9ft 10in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked and made into preserves[2, 11, 105, 177, 183]. Fairly juicy with a nice slightly acid flavour[K]. The fruits are about 8mm long[200]. Leaves and young shoots - cooked[2, 177, 183]. Leaves are a tea substitute[177, 183]. tcanta DyeA yellow dye is obtained from the root.

dwatta Antibacterial Aperient Cancer Carminative Dysentery Febrifuge OphthalmicThe roots are aperient, carminative, febrifuge and ophthalmic[11, 46, 61, 158, 240]. They are used in the treatment of eye complaints, menorrhagia, chronic diarrhoea and piles[240]. The leaves have been used in the treatment of jaundice[240]. Berberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils.

A fairly hardy plant but it suffers some damage in severe winters[1]. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they re-sprout well from the base[200].

### 6.2.144 Vaccinium arctostaphylos

Caucasian Whortleberry

5 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutil tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium arctostaphylos is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[177]. The fruit is juicy with a slightly acid flavour, it makes an acceptable fruit to nibble on, though it is nothing special[K]. The fruit is usually produced abundantly when the plant is well sited[K]. The pear-shaped fruit is small, about 8 - 10mm in size[183]. The leaves are a tea substitute[183].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present[11, 200]. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. A plant growing in fairly heavy woodland shade at Westonbirt Arboretum in Gloucester was fruiting very heavily in September 1996, and we have seen several other plants fruiting well in dappled shade[K]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Closely related to *V. padifolium*[182], differing mainly in that species usually being evergreen[11]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.145 Rubus kuntzeanus

5 tin 9 cyuc 3 kcaak 1 tcan 0 dwat 3 m hkuc hmimhtut cyutil tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Rubus kuntzeanus is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. A good flavour[11, 177]. The orange-red fruit is about 20mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - sow spring in greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Basal cuttings in spring. Harvest the shoots when they are about 8 - 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Alpine garden, Border, Container, Foundation, Massing, Rock garden. Prefers a light dry well-drained moderately fertile humus-rich soil in a sunny sheltered position[200]. Prefers an alkaline soil. Established plants are drought tolerant[190]. A very ornamental plant[1], it is not generally very long-lived though it normally self-sows freely[190]. The sub-species lewisii (which is seen as a separate species by some botanists or as no more than a synonym of this species by others) is more desirable for its fibre and has been cultivated by the N. American Indians for this purpose[155]. Special Features: Naturalizing.

### 6.2.199 Calamintha nepeta

Lesser Calamint

5 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 0.6 m hkuc htut cyutil kyuctcup hwicli hrasjlut hpa7tli prikklwisslip hpa7tmwatli xre7t hjonli

drutta Calamintha nepeta is a PERENNIAL growing to 0.6 m (2ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: Condiment TeaThe leaves have a strong pennyroyal-like fragrance and are more pungent than calamint (*C. sylvatica*) [183]. They can be used as a flavouring[183]. A sweet and aromatic herb tea is made from the leaves[200].

tcanta Attracts wildlife.

dwatta Aromatic Diaphoretic Expectorant Febrifuge StomachicLesser calamint was commonly used as a medicinal herb in medieval times, though is little used by modern herbalists[238]. It is sometimes cultivated as a medicinal herb for household use. The whole plant is aromatic, diaphoretic, expectorant, febrifuge and stomachic[4, 148]. The leaves are harvested in July as the plant comes into flower and are dried for later use[4]. An infusion is beneficial in cases of flatulent colic and weaknesses of the stomach[4], it is also used to treat depression, insomnia and painful menstruation[238]. It should not be prescribed for pregnant women since in excess it can cause a miscarriage[238].

propta Seed - sow spring in a greenhouse and only just cover the seed. It usually germinates in 2 weeks at 21 °c[138]. Prick out the seedlings when they are large enough to handle and, if they grow sufficiently, plant them out into their permanent positions in the summer otherwise wait until the following spring. Division in spring. Very easy, larger clumps can be planted direct into their permanent positions. It is best to pot up smaller clumps and grow them on in a cold frame until they are well rooted before planting them out in the summer. Basal cuttings in May or June. They should be rooted in a sandy compost[245]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Prefers a well-drained dry to moist neutral to alkaline soil and a warm sunny position[200, 238]. Plants are hardy to about -15 °c[187]. This species is very closely related to *C. sylvatica*, and is considered to be no more than a sub-species by some botanists[4]. A very good bee plant[187]. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30 °C). At this

temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (120 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

### 6.2.200 Calamintha sylvatica

Calamint, Woodland calamint

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutil kyuctcup hwicli hrasjlut hpa7tli flatprikklwisslip hpa7tmwatli xre7t hjonli

drutta Calamintha sylvatica is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: Condiment TeaA sweet and aromatic herb tea is made from the leaves[200]. Very refreshing[4, 200]. Leaves - used as a flavouring in cooked dishes[177]. Pleasantly pungent and strongly aromatic, the flavour is said to resemble a cross between mint and marjoram[183].

tcanta None known

dwatta Aromatic Diaphoretic Expectorant StomachicCalamint was commonly used as a medicinal herb in medieval times, though is little used by modern herbalists[238]. It has very similar properties to lesser calamint (*C. nepeta*) though is milder in its actions[238]. It is sometimes cultivated as a medicinal herb for household use. The whole plant is aromatic, diaphoretic and expectorant[4]. The leaves are harvested in July as the plant comes into flower and are dried for storage[4]. An infusion is beneficial in cases of fevers, flatulent colic and weaknesses of the stomach[4], it is also used to treat depression, insomnia and painful menstruation[238]. Its expectorant action makes it a good cough and cold remedy and it is of value for treating mild respiratory infections[254]. It is best mixed with other herbs, especially yarrow (*Achillea millefolium*) and Thyme (*Thymus vulgaris*) [254]. Calamint should not be prescribed for pregnant women since in excess it can cause a miscarriage[238].

propta Seed - sow spring in a greenhouse and only just cover the seed. It usually germinates in 2 weeks at 21 °c[138]. Prick out the seedlings when they are large enough to handle and, if they grow sufficiently, plant them out into their permanent positions in the summer otherwise wait until the following spring. Division in spring. Very easy, larger clumps can be planted direct into their permanent positions. It is best to pot up smaller clumps and grow them on in a cold frame until they are well rooted before planting them out in the summer. Basal cuttings in May or June. They should be rooted in a sandy compost[245]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in a well-drained dry to moist neutral to alkaline soil and a sunny position[1]. Likes semi-shade[200]. Succeeds in a woodland garden[200]. Bees love the flowers of this plant[K].

### 6.2.201 Plantago coronopus

Buck's-Horn Plantain

5 tin 9 cyuc 3 kcaak 2 tcan 2 dwat 0.3 m hkuc htut cyutil kyuctcup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli fyfkrx7t hjonli



5 tlin 7 cyuc 3 kcaak 0 tcan 1 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Claytonia virginica is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower from March to April, and the seeds ripen in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[2, 55, 62, 85, 257]. Rich in starch, it has a pleasant nutty flavour[105, 183]. A radish-like flavour when raw[159], it tastes like a cross between a potato and a chestnut when cooked[183]. The root is rich in vitamins A and C[159]. The globose tuber is up to 20cm in diameter[270]. Leaves and flowering stems - raw or cooked[62]. Added to salads or used as greens[183]. The leaves are often available in the winter.

tcanta None known

dwatta Antispasmodic ContraceptiveA cold infusion or decoction of the powdered roots has been given to children with convulsions[257]. It has been said that eating the raw plants can permanently prevent conception[257].

propta Seed - surface sow on a peat based compost in spring in a cold frame. Germination usually takes place within 2 - 4 weeks at 10°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Division of offsets in spring or autumn.

nwatta Landscape Uses:Rock garden, Woodland garden. Prefers a damp peaty soil and a position in full sun[1, 164]. Another report says that it requires some shade[188]. Requires a lime-free soil[164]. Special Features:North American native, Naturalizing, Wetlands plant. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. Ephemeral emerging in spring and dying back by summer every year [1-2]. The root pattern is a corm swelling at the stem base [1-2].

### 6.2.197 Vaccinium deliciosum

Alpine Blueberry, Cascade bilberry
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium deliciosum is a deciduous Shrub growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[11, 60, 177, 257]. When fully ripe it is sugary sweet with a delightful aroma and a full rich flavour[183]. Best eaten out of hand[183], the fruit can also be dried for later use[257]. The fruit is about 6mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored

seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Grows well in a moist position in a rock garden[11]. Plants spread rapidly when growing in a suitable position[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. This species is closely allied to *V. caespitosum*[11, 182]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.198 Linum perenne

Perennial Flax, Blue flax, Alpine flax

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.3 m hkuc htut cyutli hgaktyucup hwicli hrasjlut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Linum perenne is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - cooked[46, 61, 183]. A pleasant nutty taste and very nutritious[94]. The seed has a high oil content and can be eaten on its own or used as a flavouring[161, 183]. It should not be eaten raw because it contains cyanide but this is destroyed in the cooking process[183].

tcanta Cosmetic Fibre Hair Oil PaperA drying oil is obtained from the seed. Used mainly for lighting[178], though it could also be used in all the ways that linseed oil (from *Linum usitatissimum*) is used - in paints, varnishes etc[115]. An infusion of the whole plant is used as a hair and skin wash[257]. It is said to be very beneficial to the skin and also to help prevent hair loss[257]. A good fibre is obtained from the stems, it is inferior to flax (*Linum usitatissimum*)[115] but is used for making cloth, nets, string, baskets, mats etc and in paper making[4, 46, 61, 74, 94, 115]. When used for paper making, the stems are harvested in late summer or autumn when they are two thirds yellow and are then reted[189]. The fibre is then stripped from the stem, cooked for two hours or more with lye and then beaten in a Hollander beater[189].

dwatta Antirheumatic Carminative Emollient Ophthalmic Poultrice StomachicThe plant is antirheumatic, carminative and stomachic[94, 257]. The oil in the seed has soothing and lubricating properties, and is used in medicines to soothe tonsillitis, sore throats, coughs, colds, constipation, gravel and stones[244]. When mixed with an equal quantity of lime water it is used to treat burns and scalds[244]. A poultice of the fresh crushed leaves has been used to treat eye problems[94, 213]. A tincture of the entire plant is used in the treatment of diarrhoea[4]. The fresh herb is boiled and taken internally for the treatment of rheumatic pains, heartburn, colds, coughs and drowsy[4, 257]. A poultice of the plant is applied to bruises to reduce the swelling[257]. The seeds are emollient[240]. An eye medicine is made from them[257]. An infusion of the roots is used as an eye-wash[257].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Closely related to *R. inominatus*[11, 105]. This species is a raspberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. The stems have very few prickles[200]. Plants in this genus are notably susceptible to honey fungus[200].

#### 6.2.146 Zanthoxylum planispinum

Winged Prickly Ash

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 3.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Zanthoxylum planispinum is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: CondimentSeed - cooked. It can be ground into a powder and used as a condiment[183], a pepper substitute[2, 46, 177]. A light roasting brings out more of the flavour[206]. The seed is an ingredient of the famous Chinese 'five spice' mixture[206]. The peel is also used[105]. Young leaves are eaten[105, 177, 183]. No further details are given.

tcanta None known

dwatta Stimulant Stomachic Tonic VermifugeThe seeds and roots are stomachic and vermifuge[46, 61, 147]. A decoction of 7 - 14 seeds is used in the treatment of abscesses, arthritis, bruises, gastritis, swellings etc[218]. The resin contained in the bark, and especially in that of the roots, is powerfully stimulant and tonic[82].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may requires up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, removed in late winter and planted into their permanent positions[113].

nwatta Prefers a good deep well-drained moisture retentive soil in full sun or semi-shade[1, 11, 200]. A very ornamental plant[1], it is usually hardy in most parts of Britain but can be damaged in severe winters[11]. Fruits are freely produced after a hot summer[11]. The flowers are formed on the old wood[206]. Dioecious. Male and female plants must be grown if seed is required. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

#### 6.2.147 Viburnum foetens

5 tlin 9 cyuc 3 kcaak 3 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli dyatxre7t hjonli

drutta Viburnum foetens is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from January to March. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105, 145, 146]. A sweetish flavour[2], but the fruit is not freely borne in Britain[K].

tcanta WoodWood - hard, close grained[146].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Requires shelter from northerly and easterly winds[200]. Plants are hardy to about -20°C[184]. A very ornamental plant[1], it flowers in the winter and the flowers are said to withstand temperatures down to -12°C without damage[11, 200]. However fruit is not often produced in this country[K]. This may be due to the plant being self-incompatible and so growing 2 or more different cultivars together may improve fruit set[11, 200]. Hand pollination may also be beneficial as well as siting the plants so that they get the maximum of protection from severe winter weather[K]. A west-facing wall or woodland edge would be ideal for this[K]. Closely allied to *V. grandiflorum* and included in that species by many botanists[11]. This species has a more westerly range, shorter stems and white flowers[200].The crushed leaves have a foetid aroma[182].

#### 6.2.148 Rheum australe

Himalayan Rhubarb

5 tlin 9 cyuc 3 kcaak 2 tcan 3 dwat 3 m hkuc hmimhtut cyutli tcup hwicli jlutnyikfrup hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rheum australe is a PERENNIAL growing to 3 m (9ft) by 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: RutinLeaf stem - raw or cooked[22, 105, 183]. An excellent flavour that is something like apples[2, 183] (this is likely to be a cooking apple!). The crop is sometimes blanched by excluding light from the growing stems, this produces an almost white stem

that is free of fibre, crisp and less acid[2]. This species makes an excellent late crop[2]. The stems can also be made into a preserve or be dried and stored for later use[183]. One report says that the plant contains 0.32% rutin[240]. It does not specify which part of the plant, though it is likely to be the leaves[K].

tcanta Dye LiningThe leaves can be up to 1 metre in diameter, they are used as a lining material and also to cover and protect fruit in baskets[2, 37]. A bright yellow dye is obtained from the root[272].

dwatta Digestive Purgative TonicRhubarb has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[238]. The main species used is *R. palmatum*. Though the chemistry varies slightly, this species is used interchangeably[238]. The root is anticholesterolemic, anti-septic, antispasmodic, antitumor, aperient, astringent, cholagogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 37, 57, 61, 171, 238, 240]. Small doses act as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Hardy to about -20°C[200]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200]. The root is sold for medicinal purposes in local markets in the Himalayas[46, 61]. Overgathering of this plant from the wild, both for food and for medicine, is becoming a cause of conservation concern[272]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of “heat days” experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 6.2.149 Ribes altissimum

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ribes altissimum is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is

pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaKa Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Small with a thick skin and a pleasant acid taste[74]. The fruit is abundantly produced in the wild[74]. The purplish-black fruit is about 7mm in diameter[266].

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 0 - 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Does well in shade though does not fruit so well in such a position[11]. Hardy to about -20°C[200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. This plant is possibly useful as part of a breeding programme for red currants[74].

## 6.2.150 Berberis x carminea

5 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwsslip hpa7tmwatli fyfjxre7t hjonli

drutta Berberis x carminea is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. The seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kckaKa Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A pleasant though strongly acidic flavour, it goes well in a muesli[K]. Most children, and a few adults, really like the fruit raw, but in general most people will prefer to cook it[K]. The fruits are about 10mm in diameter[200].

tcanta DyeA yellow dye is obtained from the root. dwatta Antibacterial Antitumor DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. This plant does not breed true from seed because it is a hybrid species. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Suckers, removed in late

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Smyrnium olusatrum is a BIENNIAL growing to 1.2 m (4ft) by 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kckaKa Edible Parts: Flowers Leaves Root StemEdible Uses: CondimentLeaves and young shoots - raw in salads or cooked in soups, stews etc[2, 5, 8, 12, 27, 37, 115, 183]. The plant comes into growth in the autumn and the leaves are often available throughout the winter[5, 52]. They have a rather strong celery-like flavour and are often blanched (by excluding light from the growing plant) before use[183]. Leafy seedlings can be used as a parsley substitute[183]. Stem - raw or cooked[2, 5, 8, 12, 27, 37, 53, 115]. It tastes somewhat like celery, but is more pungent[17, 244]. The stem is often blanched (by excluding light from the growing plant) before use[183]. Flower buds - raw[12, 52]. Added to salads, they have a celery-like flavour[K]. The spicy seeds are used as a pepper substitute[52, 183]. Root - cooked. Boiled and used in soups, its flavour is somewhat like celery. The root is said to be more tender if it has been kept in a cool place all winter[183].

tcanta A good wildlife plant. Scented. A good plant for food forests/forest gardens.

dwatta Bitter DigestiveThe whole plant is bitter and digestive. It has been used in the past in the treatment of asthma, menstrual problems and wounds, but is generally considered to be obsolete as a medicinal plant[238].

propta Seed - best sown in an outdoor seedbed in autumn and planted into its permanent position in late spring[1, 200]. Germination can be slow[200]. The seed can also be sown in situ in spring.

nwatta Succeeds in most soils but prefers an open sunny position in a well-drained moisture retentive soil[200]. Hardy to about -15°C[200]. At one time this plant was extensively grown for its edible leaves and stems but it has now fallen into virtual disuse, having been replaced by celery[1, 2, 27, 37, 61, 183]. The seeds are highly aromatic with a myrrh-like scent[245]. A good bee plant. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 6.2.194 Berberis aggregata

Salmon Barbery  
5 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Berberis aggregata is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckaKa Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A fairly acid lemony flavour, it can be eaten in quantity by those who like acid fruits - children seem particularly keen on it[K]. A very reliable cropper, the fruit is borne in abundance along the stems[1, K]. The fruit is about 7mm in diameter[200].

tcanta DyeA yellow dye is obtained from the root. dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by

the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Layering.

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. Hybridizes freely with other members of this genus, especially the closely related *B. wilsonae*[1]. The true species is seldom seen in gardens, having been replaced with its hybrid progeny[182]. The seedling 'Sibbertoft Coral' is very closely related to *B. aggregata* and fruits well in Britain[11]. Plants can be pruned back quite severely and will resprout well from the base[200].

## 6.2.195 Smyrnium perfoliatum

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Smyrnium perfoliatum is a BIENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaKa Edible Parts: Flowers Leaves StemEdible Uses: CondimentLeaves and young shoots - raw in salads or cooked in soups, stews etc[2, 5, 8, 12, 27, 37, 115, 183]. The plant commences growth in the autumn and the leaves are often available throughout the winter[5, 52]. They have a rather strong celery-like flavour and are often blanched (by excluding light from the growing plant) before use[183]. Leafy seedlings can be used as a parsley substitute[183]. Stem - raw or cooked[2, 5, 8, 12, 27, 37, 53, 115]. Tasting somewhat like celery[17], it is often blanched (by excluding light) before use[183]. This species is considered to be superior to the related *S. olusatrum* because it not only blanches better but is also more crisp and tender and not so harsh flavoured[183]. Flower buds - raw[12, 52]. A celery-like flavour, they can be added to salads. The spicy seeds are used as a pepper substitute[52, 183]. Root - cooked. Boiled and used in soups. The root is said to be more tender if it has been kept in a cool place all winter[183].

tcanta None known dwatta None known

propta Seed - best sown in an outdoor seedbed in autumn and planted into its permanent position in late spring[1, 200]. Germination can be slow[200]. Can also be sown in situ in spring[188].

nwatta Succeeds in most soils but prefers an open sunny position in a well-drained moisture retentive soil[1, 200]. Self-sows freely with us in our Cornwall garden, in a sunny, sheltered position[K].

## 6.2.196 Claytonia virginica

Spring Beauty, Virginia springbeauty, Hammond's claytonia, Yellow Virginia springbeauty

20°c[200]. Well suited to naturalistic plantings in a woodland or wild garden[200]. A sweetly aromatic plant[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is fleshy. Thick or swollen - fibrous or tap root [1-2].

### 6.2.191 Lilium auratum

Golden-Rayed Lily

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium auratum is a BULB growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[4, 46]. Sweet and mucilaginous with a mild flavour that makes them acceptable to people who have never tried them before[2, 183]. The bulbs are used as a vegetable, and can also be boiled, sweetened, powdered and used in dumplings[183]. Large, they can be up to 17cm in diameter[61, 143].

tcanta None known

dwatta None known

propta Seed - delayed hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Root bulbs - dig up in autumn and pot up in a cold frame for the first year[163]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulbets. These bulbets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Requires a well-drained lime-free peaty soil in a warm position with its roots in the shade[1, 28, 47, 90, 200]. Enjoys abundant moisture so long as the soil is very well drained[47]. Prefers an open woodland position or growing amongst dwarf evergreens[1]. The plant deteriorates rapidly if grown in much shade[143]. Fertilizers, rich soils and lime are fatal to this plant[143]. Stem rooting, the bulbs should be planted about 25 - 30 cm deep[143, 200]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very ornamental plant[1], but short-lived in cultivation[200]. It grows better in warmer climates than Britain[90]. The variety 'Platyphyllum' has larger flowers than the type and is more amenable to adverse conditions[245]. The flowers have a penetrating spicy aroma[245]. Cultivated for its edible bulb in Japan[2, 163]. The plant should be protected against slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

### 6.2.192 Lilium candidum

Madonna Lily

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lilium candidum is a BULB growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from October to July, in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. The raw bulb contains an acrid principle, but this is destroyed by drying or thorough heating[4]. When cooked the bulb is pulpy, sweet and sugary[4]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (Solanium tuberosum). tcanta EssentialAn essential oil from the flowers is used in perfumery[4, 61].

dwatta Astringent Demulcent Emmenagogue Emollient Epilepsy ExpectorantThe Madonna lily has a long history of herbal use, though it is seldom employed in modern herbalism because of its scarcity[238]. The bulb and the flowers are astringent, highly demulcent, emmenagogue, emollient and expectorant[4, 7, 238]. The plant is mainly used externally, being applied as a poultice to tumours, ulcers, external inflammations etc[4, 238]. The bulb is harvested in August and can be used fresh or dried[4, 238]. The flowers are harvested when fully open and used fresh for making juice, ointments or tinctures[238]. The pollen has been used in the treatment of epilepsy[240].

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulbets. These bulbets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. Bulbets are formed on the stem just below the soil surface. These should be dug up in the autumn and replanted immediately, preferably in a cold frame for growing on until large enough to plant out into the garden[143, 163]. The formation of bulbils on the stem can be induced by either removing the stem at flowering time and layering it just below the soil surface, or by removing all the flowers before they open.

nwatta Prefers an open free-draining humus-rich fertile loamy soil with its roots in the shade and its head in the sun[90, 200]. Prefers a sunny position[143] but also succeeds in shade[163]. Succeeds in ordinary garden soil[1]. Grows well in acid[42] and limy soils[4, 42, 47, 90], though it prefers a limey soil[200]. A very ornamental plant[1, 7]. It is seen as a symbol of purity and in Christian tradition is devoted to the Virgin Mary, in pre-Christian times it was sacred to Juno, the Goddess of heaven[238]. The flowers have a scent of heather honey[245]. The Madonna lily is generally very hardy and easy to grow[143] but it is unpredictable and does not grow or flower well in all gardens[90, 238]. It is also susceptible to botrytis[143]. Only just cover the bulb with soil[47, 200]. It is best to leave the clumps undisturbed since they resent being moved[143, 238], but if you need to transplant then this is best done in late August to early September, certainly no later than mid-October[143]. Plants produce a basal rosette of over-wintering leaves in the autumn[200], these die off as the plant comes into flower[188]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

### 6.2.193 Smyrniolum olusatrum

Alexanders

5 tlin 9 cyuc 3 kcaak 2 tcan 1 dwat 1.2 m hkuc

autumn/early winter and planted out in situ or potted up and planted out in late spring[200].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Grows well on chalky soils[11]. Plants are hardy to about -15°c[184]. A very ornamental plant[1], there are several named varieties[182]. The cultivar 'Buccaneer' bears very large crops of large fruits, even on small plants[K]. A good bee plant[108], the flowers are very fragrant. Plants can be pruned back quite severely, they resprout well from the base[200].

### 6.2.151 Crambe cordifolia

Flowering sea kale

5 tlin 9 cyuc 3 kcaak 3 tcan 1 dwat 2 m hkuc hmimhtut cyutli hgatykcucup hwicli hyishrasjlutnyik hpa7tli prikklwis hpa7tmwatli xre7t hjonli

drutta Crambe cordifolia is a PERENNIAL growing to 2 m (6ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked[2, 105, 177]. Used as a potherb[183]. Young leaves have a pleasant cabbage-like flavour, though older leaves are rather tough[K]. Root - cooked[2, 145, 177].

tcanta Plants can be used for ground cover when planted about 1.2 metres apart each way. They form large clumps[208].

dwatta AntipruriticThe plant is used as a cure for itch[240].

propta Seed - sow March/April in a seedbed outdoors and either thin the plants out or move them to their permanent positions when about 10cm tall[111]. The young plants are very attractive to slugs so some protection will often be needed. Germination can be slow so it is best to sow the seed in pots in a cold frame[164]. Germination usually takes place in 3 - 26 weeks at 15°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are at least 10cm tall. Division in spring or autumn[1, 111]. Dig up the root clump and cut off as many sections as you require, making sure they all have at least one growing point. The larger of these divisions can be planted out straight into their permanent positions, though small ones are best potted up and grown on in a cold frame until they are established. Root cuttings, 3 - 10 cm long, in spring[104]. These can be planted straight into the open ground or you can pot them up in the greenhouse and plant them out once they are growing strongly.

nwatta An easily grown plant, succeeding in a good loam and an open sunny position[1, 111, 200] but also tolerating some shade[188]. Prefers a slightly alkaline soil in a position sheltered from strong winds[200]. Another place in this report says that the plant tolerates maritime exposure[200]. Tolerates poor and dry soils and some shade[200]. Dislikes acid soils[1]. Established plants are drought tolerant[190]. Plants are hardy to about -20°c[187]. A deep-rooted plant[233], it dislikes root disturbance. The young growth in spring is adored by slugs[K]. Plants can be grown in the summer meadow if the grass is not cut too low, since this would damage the growing point[200]. The flowers emit a delicious wallflower-like scent in hot sunny weather[245].

### 6.2.152 Ribes himalense

5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Ribes himalense is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June, and

the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[51, 272]. The fruit is quite large, but so are the seeds[200]. The fruit is red, turning purplish black on maturity and is about 7mm in diameter[266].

tcanta None known

dwatta Astringent Dysentery PoulticeThe juice of the leaf is used in the treatment of diarrhoea and dysentery[272]. A paste of the leaves is applied to cuts and wounds[272].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between 0 to 9°c and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[11]. Hardy to about -20°c[200]. This species is closely related to *R. petraeum*[200]. Plants can harbour a stage of white pine blister rust, so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.153 Mahonia napaulensis

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 2.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Mahonia napaulensis is an evergreen Shrub growing to 2.5 m (8ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[272]. An acid flavour, but it is rather nice raw especially when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. The fruit can also be dried and used as raisins[2, 51, 158, 177]. The ovoid fruit is about 12mm long[200].

tcanta DyeA yellow dye is obtained from the stem and leaves[61].

dwatta Antibacterial Antitumor Dysentery Ophthalmic TonicThe fruits are said to be diuretic and demulcent[240, 272]. They are used in the treatment of dysentery[240]. A decoction of the bark is used as eye drops to treat inflammations of the eyes[272]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°c. Prick

out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Cuttings of half ripe wood 15cm long, July in individual pots in a frame[78]. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta An easily grown plant, it thrives in any good garden soil[11]. Grows well in heavy clay soils. Prefers a semi-shaded woodland position in a damp slightly acid to neutral humus rich soil[200]. Requires a position sheltered from cold or strong winds[1]. The plant is slightly tender in Britain[1] though it does well in Cornwall[59]. It under performs in areas where temperatures regularly fall below -10°C[200]. The young growth in spring can be damaged by late frosts[K]. Hybridizes freely with other members of this genus. The flowers have a delicate sweet fragrance[245]. At least one named variety has been developed for its ornamental value. 'Maharajah' appears to be harder than the type species[182]. Closely allied to *M. acanthifolia*[11] (which is quoted as a synonym of this species in some books). The differences stated between the two species do not hold true in the wild but in cultivation *M. acanthifolia* has leaflets with a dull surface, flowers in the autumn and is harder than many of the spring flowering introductions of *M. nepaulensis*. Resistant to honey fungus[88].

### 6.2.154 Cynara cardunculus

Cardoon

5 tlin 9 cyuc 3 kcak 1 tcan 5 dwat 2 m hkuc htut cyutli hgatkyuctup hwicli hyhshrasljutnykfrip hpa7tli flatprikwlshsom hpa7tmwatli xre7t hjonli

drutta Cynara cardunculus is a PERENNIAL growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Root StemEdible Uses: Curdling agentFlower buds - raw or cooked[33, 105]. A globe artichoke substitute[183]. The flower buds are a bit smaller than the globe artichoke and so are even more fiddly to use[K]. The buds are harvested just before the flowers open, they are then usually boiled before being eaten. Only the base of each bract is eaten, plus the 'heart' or base that the petals grow from [K]. The flavour is mild and pleasant and is felt by some people to be more delicate than the globe artichoke[K]. Stems - cooked and used as a celery substitute[2, 27, 33, 46, 61]. It is best to earth up the stems as they grow in order to blanch them and reduce their bitterness[4], these blanched stems can then be eaten cooked or in salads[105, 132, 183]. In Italy raw strips of the stems are dipped into olive oil[183]. We find these stems to be too bitter when eaten raw[K]. Young leaves - raw or cooked. Eaten as a salad by the ancient Romans[183]. Rather bitter[K]. Root - cooked like parsnips[27, 105, 183]. Tender, thick and fleshy, with an agreeable flavour[183]. The dried flowers are a rennet substitute, used for curdling plant milks[105, 183].

tcanta DyeThe plant is said to yield a good yellow dye[4], though the report does not say which part of the plant is used.

dwatta Anticholesterolemic Chologogue Digestive DiureticThe cardoon has become important as a medicinal herb in recent years following the discovery of cynarin. This bitter-tasting compound, which is found in the leaves, improves liver and gall bladder function, stimulates the secretion of digestive juices, especially bile, and lowers blood cholesterol levels[238, 254]. The leaves are anticholesterolemic, antirheumatic, chologagogue, digestive, diuretic, hypoglycaemic and lithontripic[7, 21, 165]. They are used internally in the treatment of chronic liver and gall bladder diseases, jaundice, hepatitis, arteriosclerosis and the early stages of late-onset diabetes[238, 254]. The leaves are best

harvested just before the plant flowers, and can be used fresh or dried[238].

propta Seed - sow early spring in a greenhouse. Germination is usually quick and good, prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions during the summer. It would be prudent to give the plants some winter protection in their first year. The seed can also be sown in situ in April. Sow the seed 2cm deep, putting 2 or 3 seeds at each point that you want a plant[1]. Protect the seed from mice[1]. Division of suckers. This is best done in November and the suckers overwintered in a cold frame then planted out in April. Division can also be carried out in March/April with the divisions being planted out straight into their permanent positions, though the plants will be smaller in their first year.

nwatta Industrial Crop: Biomass Management: Hay Management: Standard Staple Crop: OilPrefers a light warm soil and an open position in full sun[37, 200]. For best results, this plant requires plenty of moisture in the growing season and a good rich soil[16, 27, 33, 37], though another report says that it is drought tolerant once established[190]. Plants grew very well with us in the hot and very dry summer of 1995, though they were looking very tatty by September[K]. Tolerates most soils including heavy clays of both acid and alkaline nature, especially when grown in heavier or more spartan soils[200]. Plants are reasonably wind resistant[200, K]. This species is hardy to about -10°C[187]. Plants are more likely to require protection from winter cold when they are grown in a heavy soil[190]. Wet winters can do more harm than cold ones[K]. At one time the cardoon was often grown for its edible stems but it has now fallen into virtual disuse[132]. There are some named varieties[183]. It is a very ornamental foliage plant and makes a very attractive feature in the garden. The leaves are long lasting in water and are often used in flower arrangements[233]. Recent taxonomic revisions (1999) have seen the globe artichoke being merged into this species. However, since from the gardener's point of view it is quite a distinctive plant, we have decided to leave it with its own entry in the database under *Cynara scolymus*[K]. Plants seem to be immune to the predations of rabbits[233]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 6.2.155 Alcea rosea

Hollyhock

5 tlin 9 cyuc 3 kcak 3 tcan 2 dwat 2.4 m hkuc htut cyutli kyucstup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Alcea rosea is a PERENNIAL growing to 2.4 m (7ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil Root StemEd Uses: Oil TeaYoung leaves - raw or cooked[2, 55, 177]. A mild flavour, but the texture leaves something to be desired[K]. They have been used as a pot-herb, though they are not particularly palatable[4]. They can also be chopped up finely and added to salads[K]. Inner portion of young stems - raw[101]. Flower petals and flower buds - raw. Added to salads[183]. A nutritious starch is obtained from the root[183]. A refreshing tea is made from the flower petals[183].

tcanta Compost Dye Litmus Oil PaperA fibre obtained from the stems is used in papermaking[189]. The fibres are about 1.9mm long. The stems are harvested in late summer, the leaves are removed and the stems are steamed until the fibres can be removed. The fibres are cooked with lye for 2 hours and then ball milled for 3 hours or pounded with mallets. The paper is light tan in colour[189]. The flowers are an alternative ingredient of 'Quick Return' herbal compost

for bees[108]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 6.2.188 Lycium pallidum

Pale Wolfberry, Pale desert-thorn, Rabbit thorn
5 tlin 9 cyuc 3 kcak 3 tcan 2 dwat 1.8 m hkuc htut cyutli kyucstup hwicli hyhshrasljutnyik hpa7tli flatpriklwis hpa7mwatli xre7t hjonli

drutta Lycium pallidum is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw, cooked or dried for later use[[46, 61, 85, 183, 257]. The fruit keeps well when dried and ground into a meal[183]. The fruit should be perfectly ripe if it is eaten raw[95]. The Hopi Indians boiled the fruit, drained off the water and ground the fruit into a mush. Clay was then mixed with water until a thick consistency was achieved, this was mixed with the berries and the whole lot eaten[216]. The fruit is about 10mm in diameter[200].

tcanta Soil stabilizationPlants have an extensive root system and can be planted to stabilize banks[200].

dwatta Cancer OdontalgicThe ground up root has been placed in a tooth cavity to bring relief from toothache[257]. The bark and the dried berries have been used as a 'life medicine'[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - sow early spring in a greenhouse. Germination is usually good and fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Pinch out the shoot tips of the young plants in order to encourage bushy growth[78]. Cuttings of half-ripe wood, 5 - 10cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, autumn to late winter in a cold frame. High percentage[78, 200]. Division of suckers in late winter. Very easy, the suckers can be planted out direct into their permanent positions. Layering.

nwatta Does not require a rich soil, flowering and fruiting better in a well-drained soil of moderate quality[11]. Succeeds in impoverished soils[200]. Requires a sunny position[200]. Tolerates maritime exposure[200]. Hardy to about -17°C[200]. Plants do not always fruit well in Britain[11], particularly after a cool summer[200].

### 6.2.189 Ribes sativum

Redcurrant

5 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7mwatli fyfxre7t hjonli

drutta Ribes sativum is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in jams, compotes, jellies, puddings, pies etc[183,

200]. An acid taste that many people find too strong to eat raw, the fruit makes an excellent jam or preserves[K]. The fruit is rich in vitamin C[183]. There are rather a lot of seeds in each fruit[K].

tcanta None known

dwatta Vitamin CNone known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade, succeeding on an east or even a north-facing wall, though not fruiting so well in such a position[11]. Prefers a pH in the range 5.5 to 6[200]. Hardy to about -20c[200]. There is some confusion in nomenclature with some botanists recognising 2 species of red currants, this species and *R. spicatum* (syn *R. rubrum*), whilst others say that *R. rubrum* is a distinct species[17, 200]. The red currant is sometimes cultivated for its edible fruit, there are some named varieties[183]. Most cultivars are self-fertile and set a good crop on their own[200]. The fruit is produced at the base of one-year old and older wood, plants start to fruit at 3 - 4 years from seed[200]. Red currant fruits are an absolute magnet for birds and so the plants will usually need some protection to allow the crop to ripen[K]. Alternatively, you can put this attraction for the birds to good use by planting red currants specifically for the birds. Whilst they are eating these fruits they will not be eating your other fruits[K]. Plants can harbour a stage of 'white pine blister rust', so should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.190 Osmorhiza longistylis

Aniseroot, Longstyle sweetroot

5 tlin 9 cyuc 3 kcak 1 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Osmorhiza longistylis is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Condiement TeaRoot - raw or cooked. Very sweet, aromatic and fleshy[222]. A spicy flavour similar to anise, the roots are chewed, made into a tea or used as a flavouring[105, 171, 183]. Leaves and young shoots - raw. An anise flavour, they are added to salads[177, 183]. The green seeds have an anise flavour and are used as a flavouring in salads, the dry seeds are added to cakes etc[183].

tcanta Scented.

dwatta Birthing aid Ophthalmic Poultice StomachicA poultice of the roots are used in the treatment of boils and wounds[207, 222]. A tea made from the roots is stomachic[222]. It has been used in the treatment of stomach complaints, kidney problems, amenorrhoea, general debility, to ease childbirth and also to bathe sore eyes[222, 257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise sow it in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in any deep moisture-retentive soil in sun or dappled shade[200]. Plants are hardy to about -

hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatprik-lwis hpa7tmwatli xre7t hjonli

drutta Mentha x smithiana is a PERENNIAL growing to 1 m (3ft 3in) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. Used as a flavouring in salads or cooked foods. The sweetly scented leaves can be used in the same ways as spearmint[238]. A good culinary mint, the leaves have an attractive red tinge[244]. A herb tea is made from the fresh or dried leaves[238]. It has a very pleasant and refreshing taste of spearmint, leaving the mouth and digestive system feeling clean[K]. An essential oil from the leaves and flowers is used as a flavouring in sweets, ice cream, drinks etc[238].

tcanta Essential Repellent StrewingAn essential oil is obtained from the whole plant. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Antiseptic Febrifuge StomachicRed rariipila mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. A tea made from the leaves of most mint species has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - this hybrid is usually sterile, and even if seed is produced it will not breed true[200]. If you do obtain seed, then it can be sown in spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta A very easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade[4]. Prefers partial shade and a slightly acid soil[4, 16]. This species is a hybrid involving *M. aquatica* x *M. arvensis* x *M. spicata*[200]. It has sweetly mint-scented leaves with similar culinary uses to *M. spicata*. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests[14, 20]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.187 Cynara scolymus

Globe Artichoke

5 tlin 9 cyuc 3 kcak 2 tcan 5 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik-lwishsom hpa7tmwatli xre7t hjonli

drutta Cynara scolymus is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is

hardy to UK zone 6 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves StemEdible Uses: Curdling agentFlower buds - raw or cooked[2, 7, 15, 16, 27, 37, 183]. Used before the flowers open[171]. The flavour is mild and pleasant[K]. Gobe artichokes are considered to be a gourmet food but they are very fiddly to eat. The buds are harvested just before the flowers open, they are then usually boiled before being eaten. Only the base of each bract is eaten, plus the 'heart' or base that the petals grow from [K]. Small, or baby artichokes, that are produced on lateral stems can be pickled or used in soups and stews[183]. Plants yield about 5 to 6 main heads per year from their second year onwards[200]. Flowering stems - peeled and eaten raw or cooked. A sweet nutty flavour[183]. Young leaf stems - a celery substitute[200]. They are normally blanched to remove the bitterness and then boiled or eaten raw[183]. We find them too bitter to be enjoyable[K]. Leaves - cooked. A bitter flavour[15, 61]. The dried flowers are a rennet substitute, used for curdling plant milks[4, 183].

tcanta DyeA dark grey dye is obtained from the leaves[7].

dwatta Anticholesterolemic Antirheumatic Appetizer Cholagogue Digestive Diuretic Hypoglycaemic LithontripicThe globe artichoke has become important as a medicinal herb in recent years following the discovery of cynarin. This bitter-tasting compound, which is found in the leaves, improves liver and gall bladder function, stimulates the secretion of digestive juices, especially bile, and lowers blood cholesterol levels[238, 254]. The leaves are anticholesterolemic, antirheumatic, cholagogue, digestive, diuretic, hypoglycaemic and lithontripic[7, 21, 165]. They are used internally in the treatment of chronic liver and gall bladder diseases, jaundice, hepatitis, arteriosclerosis and the early stages of late-onset diabetes[238, 254]. The leaves are best harvested just before the plant flowers, and can be used fresh or dried[238]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Cynara scolymus* (*Cynara cardunculus* subsp. *flavescens*) for liver and gallbladder complaints, loss of appetite (see [302] for critics of commission E).

propta Seed - sow early spring in a greenhouse. Germination is usually quick and good, prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions during the summer. It would be prudent to give the plants some winter protection in their first year. The seed can also be sown in situ in April. Sow the seed 2cm deep, putting 2 or 3 seeds at each point that you want a plant[1]. Protect the seed from mice[1]. Division of suckers. This is best done in November and the suckers overwintered in a cold frame then planted out in April. Division can also be carried out in March/April with the divisions being planted out straight into their permanent positions, though the plants will be smaller in their first year.

nwatta Prefers a light warm soil and an open position in full sun[15, 16, 33, 37]. Requires plenty of moisture in the growing season and a good rich soil[200]. Prefers a sheltered position[200] but plants are reasonably wind resistant[K]. Plants are tolerant of saline conditions[4]. Plants succeed in cool climates though they may need protection in cold winters[200], they are unlikely to thrive in the north of Britain. Wet winters are far more likely to cause problems than cold ones[4, K]. The globe artichoke is often cultivated in the garden and sometimes commercially for its edible flower buds, there are some named varieties[183, 200]. It is best to renew the plants by division of the suckers every 3 years but they do live for a number of years[200]. The plant has recently been reclassified (1999) as not having specific status but being part of *C. cardunculus*. However, since it is distinct enough from the gardener's viewpoint (having a much larger seedhead) we have decided to leave it with its own entry for the time being[K]. Plants seem to be immune to the predations of rabbits[233]. The flowering plant is a magnet

activator[32]. This is a dried and powdered mixture of several herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost[K]. The seed contains 12% of a drying oil[114, 240]. The red anthocyanin constituent of the flowers is used as a litmus[114]. A brown dye is obtained from the petals[168].

dwatta Antinflammatory Astringent Demulcent Diuretic Dysentery EmollientFebrifugeThe flowers are demulcent, diuretic and emollient[4, 21]. They are useful in the treatment of chest complaints[4], and a decoction is used to improve blood circulation, for the treatment of constipation, dysmenorrhoea, haemorrhage etc[218]. The flowers are harvested when they are open and are dried for later use[238]. The shoots are used to ease a difficult labour[218]. The root is astringent and demulcent[240]. It is crushed and applied as a poultice to ulcers[218]. Internally, it is used in the treatment of dysentery[240]. The roots and the flowers are used in Tibetan medicine, where they are said to have a sweet, acrid taste and a neutral potency[241]. They are used in the treatment of inflammations of the kidneys/womb, vaginal/seminal discharge, and the roots on their own are used to treat loss of appetite[241]. The seed is demulcent, diuretic and febrifuge[240].

propta Seed - sow April/May or August/September in pots or in situ[200, 238]. Easily grown from seed, which usually germinates in about 2 - 3 weeks at 20°C[133, 268]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering. Only use rust-free specimens. Root cuttings in December. Basal cuttings at almost any time of year.

nwatta Landscape Uses:Border, Container, Foundation, Specimen. Succeeds in most soils[1]. Poor soils should be enriched with organic matter[1, 111]. Prefers a heavy rich soil and a sheltered sunny position[200]. Plants are hardy to about -15°C[200]. A very ornamental plant, it is usually grown as a biennial due to its susceptibility to the fungal disease 'rust'[1, 200]. There are many named varieties[238]. Young plants, and also the young growth in spring, are very attractive to slugs[K]. Special Features:Attracts birds, Attracts butterflies, Suitable for cut flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 10 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 6.2.156 Lycium ruthenicum

5 tlin 9 cyuc 3 kcak 3 tcan 2 dwat 2 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik-lwishsom hpa7tmwatli xre7t hjonli

drutta Lycium ruthenicum is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[146, 177]. Only the fully ripe fruits should be eaten[K].

tcanta Soil stabilizationPlants are very drought tolerant and have an extensive root system. They can be planted to stabilize banks and sandy soils[200, 266].

dwatta Cancer OphthalmicThe plant is used as an ointment to treat blindness in camels[240]. The fruit of many members of this genus is a very rich source of vitamins and

minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - sow early spring in a greenhouse. Germination is usually good and fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Pinch out the shoot tips of the young plants in order to encourage bushy growth[78]. Cuttings of half-ripe wood, 5 - 10cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, autumn to late winter in a cold frame. High percentage[78, 200]. Division of suckers in late winter. Very easy, the suckers can be planted out direct into their permanent positions. Layering.

nwatta Does not require a rich soil, flowering and fruiting better in a well-drained soil of moderate quality[111]. Succeeds in impoverished and saline soils[200, 266]. Requires a sunny position[200]. Tolerates maritime exposure[200] and drought[266].

## 6.2.157 Zanthoxylum piperitum

Japanese Pepper Tree

5 tlin 9 cyuc 3 kcak 1 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik-lwis hpa7tmwatli nyanhjen hjonli

drutta Zanthoxylum piperitum is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Leaves SeedEdible Uses: CondimentSeed - cooked. It is ground into a powder and used as a condiment, a pepper substitute[1, 2, 11, 34, 183]. The fruit can also be used[116]. It is often heated in order to bring out its full flavour and can be mixed with salt for use as a table condiment[183]. The ground and dry-roasted fruit is an ingredient of the Chinese 'five spice powder'[238]. The bark and leaves are used as a spice[2, 105, 238]. Young leaves - raw or cooked. They are used in soups or as a flavouring in salads[177, 179, 183].

tcanta ParasiticideIn Japan, the thick wood of the tree is traditionally made into a gnarled and rough-hewn wooden pestle, to use with suribachi.

dwatta Antibacterial Antifungal Antiperiodic Antitussive Carminative Diuretic Parasiticide Stimulant StomachicAntiperiodic, antitussive, carminative, diuretic, parasiticide, stimulant[178]. The fruit contains an essential oil, flavonoids and isouquinoline alkaloids[279]. It is antihelmintic, antibacterial, antifungal and stomachic[279]. It inhibits the synthesis of prostaglandin and, in larger doses, is toxic to the central nervous system[279]. It is used in Korea in the treatment of tuberculosis, dyspepsis and internal parasites[279]. The resin contained in the bark, and especially in that of the roots, is powerfully stimulant and tonic[82].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may require up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, removed in late winter and planted into their permanent positions[113].

nwatta Easily grown in loamy soils in most positions, but prefers a good deep well-drained moisture retentive soil

in full sun or semi-shade[1, 11, 200]. A very ornamental plant[1], it is hardy to about -15°C[184]. Flowers are formed on the old wood[206]. The bruised leaves are amongst the most powerfully aromatic of all leaves[245]. Dioecious. Male and female plants must be grown if seed is required. Self-sown seedlings have occasionally been observed growing in bare soil under the parent plant[K]. A good forest garden plant. Some reports suggest it can grow in deep shade. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 6.2.158 Mahonia bealei

Beale's barberry, Leatherleaf Mahonia

5 tin 8 cyuc 3 kcaak 0 tcan 2 dwat 2 m hkuc  
pcimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Mahonia bealei is an evergreen Shrub growing to 2 m (6ft) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from January to March, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A pleasant acid flavour; it is nice when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. The fruit is about 10mm long and 6mm wide[200], it ripens in April/May and if the plant is in a sheltered position the crops can be fairly heavy[K].

tcanta None known

dwatta Antibacterial Antiphlogistic Antirheumatic Cancer Depurative Dysentery Febrifuge TonicThe leaf is febrifuge and tonic[218]. A decoction of the root and stems is antiphlogistic, antirheumatic, depurative and febrifuge[147, 218]. A decoction is used in the treatment of pulmonary tuberculosis, recurring fever and cough in rundown body systems, rheumatoid arthritis, backache, weak knees, dysentery and enteritis[147]. The root and root bark are best harvested in the autumn[213]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta Landscape Uses:Border, Foundation, Pest tolerant, Massing, Rock garden, Specimen, Woodland garden. Thrives in any good garden soil[11]. Grows well in heavy clay soils. Survives under quite heavy tree cover[11], thriving in dense shade[182]. Prefers a semi-shaded woodland position in a damp, slightly acid to neutral humus-rich soil[200]. The fully dormant plant is hardy to about -20°C[184], though the young growth in spring can be damaged by late frosts. Scarcely distinct from *M. japonica*[11, 200], differing mainly

in its broader leaflets which are placed closer together on the stem and its erect flower racemes[245]. It is often treated as a subspecies of *M. japonica*, despite the fact that this species is found in the wild whilst *M. japonica* is a cultigen and not a wild plant[11, 200]. Plants of the two species are often confused in cultivation. The flowers are sweetly scented[245]. Hybridizes freely with other members of this genus. Special Features:Attractive foliage, Not North American native, Extended bloom season in Zones 9A and above, Fragrant flowers, Attractive flowers or blooms.

## 6.2.159 Rubus amabilis

5 tin 9 cyuc 3 kcaak 1 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rubus amabilis is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 11, 61, 105]. Large with a good flavour[46]. A sweet taste[177]. The fruit is about 16mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200].Prefers a humus-rich soil[184]. Hardy to about -20°C[184]. A very ornamental plant[1]. This species is a raspberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.160 Calycanthus floridus

Carolina Allspice, Eastern sweetshrub, Strawberry Bush, Sweetshrub, Carolina Allspice

5 tin 10 cyuc 3 kcaak 2 tcan 2 dwat 2.7 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Calycanthus floridus is a deciduous Shrub growing to 2.7 m (8ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe aromatic bark is dried and used as a substitute for cinnamon[2, 11, 46, 61, 105, 161, 183]. Some caution is advised, see reports above on toxicity[270].

tcanta Disinfectant RepellentLeaves contain small quantities of camphor. They can be used as an insect repellent, perfume and disinfectant[169, 257].

dwatta Antiperiodic Antispasmodic Cardiac Disinfectant Diuretic Emetic Ophthalmic SkinAntispasmodic, disinfectant[106, 169]. The plant contains an alkaloid that has a powerfully depressant action on the heart[4]. A fluid extract has been used as an antiperiodic[4]. A tea made from the root or bark has been used as a strong emetic and diuretic for kidney and bladder ailments[222, 257]. A cold tea has been used as eye drops in the treatment of failing eyesight[222, 257].

be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. A hybrid species, it will not breed true from seed. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. This is probably not a true species but a hybrid involving *B. wilsonae* and perhaps *B. aggregata*. There are a number of named varieties selected for their ornamental value, many of these have quite large fruits which are freely borne. The cultivar 'Crawleyensis' has fruits up to 1.5cm long[200]. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they resprout well from the base[200].

## 6.2.184 Osmorhiza occidentalis

Western Sweet-Cicely, Western sweetroot

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Osmorhiza occidentalis is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root SeedEdible Uses: CondimentThe root has a sweet liquorice or anise flavour and can be dried, ground into a powder and used as a flavouring for biscuits etc[85, 183, 257]. The taste is probably too strong for the whole root to be used as a vegetable[85]. The dried seeds are used as a flavouring[85, 183, 257]. The unripe seed, when still fleshy, can be nibbled raw[85, 183].

tcanta Deodorant Incense InsecticideThe roots have been used by women as a feminine deodorant[257]. They have also been placed in the clothes cupboard to impart a nice smell to clothes and have been used to rinse babies nappies[257]. A decoction of the root has been used as a dip to kill lice in chickens[257].

dwatta Antiseptic Carminative Deodorant Febrifuge Ophthalmic Oxytoxic Pectoral Poultice Skin StomachicWestern sweet-cicely was widely employed medicinally by several native North American Indian tribes who used it particularly to treat digestive disorders and as an antiseptic wash for a range of problems[257]. It is little, if at all, used in modern herbalism. An infusion of the plant is used in the treatment of coughs and colds[61, 257]. The roots are antiseptic, carminative, febrifuge, oxytoxic, pectoral and stomachic[257]. An infusion has been used to induce labour in a pregnant woman and to treat fevers, indigestion, flatulence, stomach aches etc[257]. An infusion of the roots has been applied externally as a treatment for swollen breasts, sores, sore eyes etc[257]. A decoction of the root has been used as a wash on venereal sores and skin rashes[257]. A poultice of the pulped roots has been used in the treatment of cuts, sores, swellings and bruises[257]. The root has been applied to teeth to relieve the pain of toothache[257]. A hot decoction of the root has been used to kill head lice[257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise sow it in early spring. When they

are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in any deep moisture-retentive soil in sun or dappled shade[200]. Plants are hardy to about -20°C[200]. Well suited to naturalistic plantings in a woodland or wild garden[200]. A sweetly aromatic plant[200].

## 6.2.185 Chaenomeles japonica

Dwarf Quince, Maule's quince, Japanese Flowering Quince  
5 tin 8 cyuc 3 kcaak 3 tcan 0 dwat 1 m hkuc  
pcimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Chaenomeles japonica is a deciduous Shrub growing to 1 m (3ft 3in) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen from November to January. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 4, 11, 177, 183]. Very harsh and acid raw but fragrant when cooked, imparting a strong pleasant flavour to jams and jellies[1, 200], it is especially good cooked with apples in apple pies[K]. The fruit is apple-shaped and about 4cm in diameter[200]. The rich aromatic juice, as tart as a lemon, is squeezed and used for culinary purposes[183].

tcanta Plants sucker freely and can be used as a ground cover. The form *C. japonica alpina* grows to about half the size of the species, it is especially suitable and can be planted about 1 metre apart each way[208].

dwatta None known

propta Seed - best sown as soon as it is ripe in a sheltered position outdoors or in a cold frame[200]. Sow stored seed in February in a greenhouse[78]. Germination usually takes place within 6 weeks[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle. If well grown, these seedling can be large enough to plant out in the summer, but give them some protection in their first winter. Otherwise plant them out in late spring of the following year[K]. Cuttings of half-ripe wood, July/August in a frame[11]. Easy[113]. Cuttings of mature wood of the current year's growth, November in a cold frame. Layering in late spring or in autumn. This is a sure and easy method, though it takes 12 months[78, 200]. Division of suckers in late winter[113]. They can be planted out straight into their permanent positions.

nwatta Landscape Uses:Border, Hedge, Massing, Woodland garden. Easily cultivated in any reasonably good soil[11]. Prefers a deep moist well-drained loam[4, 11]. Grows well in heavy clay soils. Tolerates full shade but requires a sunny position for best fruit production[3, 11, 200]. Becomes chlorotic in very alkaline soils[200]. Tolerates atmospheric pollution[200]. A very ornamental plant[1], it is hardy to about -25°C[200] and fruits freely in Britain[11]. Plants are occasionally cultivated for their edible fruit[183]. This species is closely allied to *C. speciosa*[11]. A good bee plant, flowering early in the year and providing pollen and nectar[108]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.186 Mentha x smithiana

Red Raripila Mint

5 tin 9 cyuc 3 kcaak 0 tcan 2 dwat 1 m hkuc



kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105, 177]. The relatively large berries are freely borne and are more palatable than most barberries[1, 3, 11]. The fruit is about 12mm in diameter[200].

tcanta DyeA yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78]. Layering.

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[200]. Plants can be pruned back quite severely and will respond well from the base[200]. Hybridizes freely with other members of this genus[1]. This species is closely related to B. ludlowii, B. cappilaris and B. parispala[200].

### 6.2.181 Rumex patientia

Herb Patience

5 tlin 10 cyuc 3 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhnt cyutli tcup hwicli hrasjutnykifrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rumex patientia is a PERENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[1, 2, 5, 37, 177]. Eaten like spinach or made into a delicious puree, they are often mixed with a quarter part of sorrel in order to add flavour to them[183]. A fairly mild flavour[183], they make an excellent vegetable[K]. The leaves are produced very early in the year[27]. Carbon Farming - The hybrid Rumex patientia x tianschanicus is a good staple crop: balanced carb.

tcanta Although no specific mention has been made for this species, dark green to brown and dark grey dyes can be obtained from the roots of many species in this genus. They do not need a mordant[168].

dwatta The juice, and an infusion of the root, has been used as a poultice and salve in the treatment of various skin problems[257]. An infusion of the root has been used in the treatment of constipation[257]. The leaves have been rubbed in the mouth to treat sore throats[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Experimental Crop Industrial Crop: Biomass Management: Coppice Management: Standard Staple Crop: Balanced carbA very easily grown plant, it succeeds in most soils, preferring a moist moderately fertile well-drained soil in a sunny position[200]. Formerly cultivated for its edible leaves[1, 2, 37, 50], these can be

available in early February if the winter is mild[K]. An important food plant for the caterpillars of many species of butterfly[30].The hybrid Rumex patientia x tianschanicus (Hybrid sorrel) is a good Carbon Farming plant. Rumex patientia x tianschanicus cultivation: new crop. Management: standard, coppice. Staple Crop: balanced carb. Industrial Crop: biomass.

### 6.2.182 Vaccinium vacillans

Dryland Blueberry

5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhnt cyutli kyuctcup hwicli hrasjut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium vacillans is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Fruit - raw or cooked. Very sweet, it is considered to be one of the best tasting blueberries[183]. The fruit is about 5mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist, but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Plants often form extensive colonies in the wild[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.183 Berberis rubrostilla

5 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 1.5 m hkuc hmimhnt cyutli kyuctcup hwicli hyishrasjlutnykifrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis rubrostilla is a deciduous Shrub growing to 1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Fairly large for a barberry, it is pear shaped with an acid flavour[K]. It can be eaten raw in small quantities, though most people would probably prefer to cook it in pies, preserves etc[K]. The fruits are about 15mm long[200].

tcanta DyeA yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not

An ooze from the bark has been used to treat children's sores, whilst an infusion has been used to treat hives[257].

propta Seed - best sown in a cold frame as soon as it is ripe. If the seed is harvested 'green' (as soon as it has fully developed but before it has dried on the plant) and sown immediately it can germinate in 3 weeks[113]. Dried seed germinates in 1 - 6 months at 15°c[138]. Stored seed requires between 3 weeks and 3 months cold stratification before sowing in the spring. When large enough to handle, prick out the seedlings into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. They can be difficult[113]. Layering in spring. Sever the new plants in a wet spell of weather about 15 months later and then lift them in the autumn[78]. High percentage[78]. Division of suckers in early spring[11]. Very easy, they can be planted straight out into their permanent positions if required.

nwatta Landscape Uses:Border, Pest tolerant, Screen, Specimen. Prefers a light loamy soil that is deep and moist but succeeds in most fertile soils[11, 182]. Requires a well-drained soil[188]. Prefers a sunny position but it tolerates shade when grown in warm temperate zones[11, 200]. Requires a sheltered position, protected from cold winds[245]. Although the dormant plant is hardy to at least -20°c, the tender young growth in the spring can be damaged by late frosts[K]. All parts of the plant are richly fragrant[182]. The flowers have a refreshing scent of ripe apples[245]. The wood, leaves and roots smell strongly of camphor, whilst the bark smells like cinnamon[245]. This species is closely related to C. mohrii[182]. A very ornamental plant, there is at least one named variety developed for its ornamental value. 'Mrs Henry Type' is a large-flowered form[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Fragrant foliage, All or parts of this plant are poisonous, Wetlands plant, Fragrant flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

### 6.2.161 Rheum palmatum tanguticum

Da Huang

5 tlin 9 cyuc 3 kcaak 0 tcan 5 dwat 2 m hkuc hmimhnt cyutli tcup hwicli jlutnykifrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rheum palmatum tanguticum is a PERENNIAL growing to 2 m (6ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Leaf stem - raw or cooked[2, 7, 105, 183]. The stem is superior in flavour to the common rhubarb and quite tender[2]. An acid flavour, it is sometimes used as a cooked fruit substitute[K].

tcanta None known

dwatta Anticholesterolemic Antiseptic Antispasmodic Antitumor Astringent Cholagogue Diuretic Haemostatic PurgativeRhubarb has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely

used herbs in Chinese medicine[238]. The root is anticholesterolemic, antiseptic, antispasmodic, antitumor, aperient, astringent, cholagogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 7, 9, 21, 91, 171, 176, 238]. The roots contain anthraquinones, which have a purgative effect, and also tannins and bitters, which have an opposite astringent effect[244]. When taken in small doses, it acts as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232, 244]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. This is a more robust form of the species[200], it is hardy to at least -15°c[238]. This sub-species is favoured for its medicinal properties over the species[244] and is cultivated as a medicinal plant in China[187]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

### 6.2.162 Arctostaphylos patula

Greenleaf Manzanita

5 tlin 9 cyuc 3 kcaak 1 tcan 1 dwat 2 m hkuc hmimhnt cyutli tcup hwicli hrasjut hpa7tli frusflat hpa7tmwatli fyifxre7t hjonli

drutta Arctostaphylos patula is an evergreen Shrub growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from March to May, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[3, 94, 105, 161]. The fully ripe fruit is pleasantly acid with a flavour resembling green apples[183]. It can be dried, ground into a powder then used in making cakes etc[257]. The fruit can also be used for making jelly and cider[183]. The fruit is about 8 - 10mm in diameter[200]. Seed - ground into a powder and added to soups etc[92]. The seed is very small and would be difficult to separate from the fruit. It would be easier to dry the whole fruit, grind this into a powder and use it in soups etc[K].

tcanta DyeA yellowish-brown dye is obtained from the leaves, it does not require a mordant[168].

dwatta Astringent Poultice VDThe leaves are astringent[94]. They have been used in the treatment of VD[257]. They are also used as a poultice on burns, cuts etc[257].

propta Seed - best sown in a greenhouse as soon as it is ripe. Pre-soak dried seed in boiling water for 10 - 20 seconds or burn some straw on top of them and then stratify at 2 - 5°c for 2 months[11, 200]. The seed usually germinates in 2 - 3 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on

in a cold frame or greenhouse for at least their first winter. Plant out in late spring or early summer. Cuttings of side shoots of the current season's growth, 5 - 8cm with a heel, August to December in a frame. The cuttings are very slow and can take a year to root[1, 78]. This species is very difficult from cuttings[166]. Division in early spring. Take care because the plant resents root disturbance. Pot the divisions up and keep them in a lightly shaded position in a cold frame or greenhouse until they are growing away actively. Layering in spring[200].

nwatta Requires a deep moist well-drained light or medium lime-free loam in sun or semi-shade[3, 11, 166, 200] but plants produce less fruit when they are grown in the shade[200]. Prefers a soil that is dry in the summer[184]. Plants are not very wind-firm[11]. Plants are hardy to about -10°C[184]. This species was growing well at Chelsea Physic garden after the harsh winter of 1985/86, showing no signs of damage[11]. Highly fire resistant[155], it can regenerate after a forest fire from a mallee-like base[166, 184]. Plants self-layer in nature[155]. A very ornamental plant[1], it grows well in Britain[3]. Plants resent root disturbance and should be placed in their final positions as soon as possible[11, 134].

## 6.2.163 Mahonia japonica

5 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 2 m hkuc pcmhmimhtut cyutli tcup hwicli hysihras|lutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Mahonia japonica is an evergreen Shrub growing to 2 m (6ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from February to April, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. An acid flavour, but it is rather nice raw especially when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. The ovoid fruit is about 9mm long[200], it ripens in spring and crops can be quite good if the plant is in a sheltered position[K]. The fruit is produced in large clusters and so is easy to harvest[K].

tcanta None known  
dwatta Antibacterial Antirheumatic Antitumor Antitusive Cancer Depurative Dysentery Expectorant Febrifuge TonicThe leaf is febrifuge and is used as a tonic in cases of cancer[218]. The seed is febrifuge and tonic[218]. The roots and stems are antirheumatic, antitussive, depurative, expectorant and febrifuge[147, 218]. A decoction is used in the treatment of bone-breaking fevers, dizziness and tinnitus, backache, weak knees, dysentery and enteritis[147]. The root and root bark are best harvested in the autumn[213]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta An easily grown shrub, it thrives in any good garden soil[11] including heavy clays. Prefers a semi-shaded

woodland position in a damp, slightly acid to neutral humus-rich soil[200]. Survives under very heavy tree shade[184]. Succeeds in poor soils when the leaves will often become bright red, especially if the plant is in full sun. The fully dormant plant is hardy to about -20°C[184], though the young growth in spring can be damaged by late frosts. Plants are very tolerant of pruning and can be cut right back into old wood if they have outgrown their welcome[182]. This species is closely related to *M. bealei*[11, 200]. It hybridizes freely with other members of the genus. The flowers have a delicious perfume[245]. The form 'Hiemalis' bears larger flower spikes which are almost as strongly scented as Lily of the Valley (*Convallaria majalis*) [245].

## 6.2.164 Arctostaphylos stanfordiana

Stanford's manzanita, Rincon manzanita  
5 tlin 9 cyuc 3 kcaok 1 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hras|lutnykfrip hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Arctostaphylos stanfordiana is an evergreen Shrub growing to 1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The dried fruit is said to have a better flavour than most members of this genus[183]. The fruit is about 5 - 7mm in diameter[200].

tcanta DyeA yellowish-brown dye is obtained from the leaves, it does not require a mordant[168].

dwatta None known  
propta Seed - best sown in a greenhouse as soon as it is ripe. Pre-soak dried seed in boiling water for 10 - 20 seconds or burn some straw on top of them and then stratify at 2 - 5°C for 2 months[11, 200]. The seed usually germinates in 2 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or greenhouse for at least their first winter. Plant out in late spring or early summer. Cuttings of side shoots of the current season's growth, 5 - 8cm with a heel, August to December in a frame. The cuttings are very slow and can take a year to root[1, 78]. The cuttings of this species usually strike readily[11]. Division in early spring. Take care because the plant resents root disturbance. Pot the divisions up and keep them in a lightly shaded position in a cold frame or greenhouse until they are growing away actively. Layering in spring[200].

nwatta Requires a deep moist well-drained light or medium lime-free loam in sun or semi-shade[3, 11, 166, 200], but plants produce less fruit when they are grown in the shade[200]. Best given a neutral or slightly acid soil[11]. A difficult plant to cultivate, even in its native California[11]. It is best given a sunny position against a wall[11]. Plants resent root disturbance and should be placed in their final positions as soon as possible[11, 134]. There are some named varieties selected for their ornamental value[200].

## 6.2.165 Mentha aquatica

Water Mint  
5 tlin 9 cyuc 3 kcaok 3 tcan 3 dwat 1 m hkuc hmimhtut cyutli tucphja7nhs6s hwicli hras|lutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Mentha aquatica is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: SweetenerThe young leaves, after fermentation[174], become very sweet and are used to make a sweet tea called 'tea of heaven', it is used in Buddhist ceremonies[11, 46, 61]. The leaves contain phellodulcin (its chemical formula is C16H14O), a very sweet substance that can be used as a sugar substitute[116, 183]. The older leaves can be dried, powdered and used as a flavouring on foods[105, 177]. The young leaves and shoots are also eaten cooked[105, 177].

tcanta Hedge HedgeCan be grown as a low hedge[29], it is quite wind tolerant.

dwatta None known  
propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Tolerates most soil[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Does well on very acid soils with a pH around 4.5[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil. Plants are hardy to about -25°C when dormant but the young growth in spring can be killed by late frosts. This species is notably susceptible to honey fungus[200].

## 6.2.178 Chaenomeles x superba

Dwarf Quince, Flowering Quince  
5 tlin 8 cyuc 3 kcaok 3 tcan 0 dwat 1 m hkuc pcmhmimhtut cyutli tcup hwicli hras|lutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Chaenomeles x superba is a deciduous Shrub growing to 1 m (3ft 3in) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from February to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - very harsh and acid raw but fragrant when cooked. Used for jams, jellies etc and as a flavouring with cooked apples[K]. The fruit can be apple or pear-shaped and up to 6cm long x 6cm wide[200].

tcanta Hedge HedgePlants can be grown to make a medium sized hedge[200]. Some cultivars, such as 'Crimson and Gold' produce suckers prolifically and are suitable for ground cover[182].

dwatta None known  
propta Seed - best sown as soon as it is ripe in a sheltered position outdoors or in a cold frame[200]. Sow stored seed in February in a greenhouse[78]. Germination usually takes place within 6 weeks[78]. Prick out the seedlings into individual pots as soon as they are large enough to handle. If well grown, these seedling can be large enough to plant out in the summer, but give them some protection in their first winter. Otherwise plant them out in late spring of the following year[K]. This species is a hybrid and so will not breed true from seed. Cuttings of half-ripe wood, July/August in a frame[11]. Easy[113]. Cuttings of mature wood of the current year's growth, November in a cold frame. Layering in late spring or in autumn. This is a sure and easy method, though it takes 12 months[78, 200].

nwatta Landscape Uses:Border, Erosion control, Ground cover, Massing, Woodland garden. Easily cultivated in any reasonably good soil[1, 11]. Prefers a deep moist well-drained loam[11]. Grows well in heavy clay soils. Tolerates full shade but requires a sunny position for best fruit production[3, 11, 200]. Becomes chlorotic on very alkaline soils[200]. Tolerates atmospheric pollution[200]. Plants are hardy to about -25°C[200]. A very ornamental plant, there are many named varieties[200, 202]. A good bee plant, flowering early in the year and providing pollen and nectar[108]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.179 Impatiens glandulifera

Jewelweed, Ornamental jewelweed  
5 tlin 9 cyuc 3 kcaok 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hras|lutnykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Impatiens glandulifera is a ANNUAL growing to 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil Oil SeedEdible Uses: Oil OilYoung leaves and shoots - cooked[172, 183]. They should not be used on a regular basis, see warning at top of record[172]. Seed - raw[105, 177]. A delicious nutty flavour[183], but difficult to harvest in quantity mainly because of their exploding seed capsules which scatter the ripe seed at the slightest touch[K] An edible oil is obtained from the seed[17, 177, 183].

tcanta Oil OilAn oil from the seed is used for lighting[17, 177].

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Impatience', 'Irritability' and 'Extreme mental tension'[209]. It is also one of the five ingredients in the 'Rescue remedy'[209].

propta Seed - sow spring in a greenhouse. A period of cold stratification may help to improve germination rates. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it is worthwhile trying an outdoor sowing in situ in the spring.

nwatta Succeeds in any reasonably good soil[1]. Grows well in heavy clay soils. Prefers a moist well-drained humus rich soil in a cool site[200]. Self sows in areas where the minimum temperature is no lower than -15°C[200]. This plant has seed capsules that spring open forcibly as the seed ripens to eject the seed a considerable distance. The capsules are sensitive to touch even before the seed is ripe, making seed collection difficult but fun[K].

## 6.2.180 Berberis angulosa

5 tlin 9 cyuc 3 kcaok 1 tcan 2 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hysihras|lutnykfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis angulosa is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

this is possible, otherwise sow it in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in any deep moisture-retentive soil in sun or dappled shade[200]. Plants are hardy to about -20°C[200]. Well suited to naturalistic plantings in a woodland or wild garden[200]. A sweetly aromatic plant[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is fleshy. Thick or swollen - fibrous or tap root [1-2].

### 6.2.174 Vaccinium erythrocarpum

Southern Mountain Cranberry
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium erythrocarpum is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked and used in jellies etc[183]. The transparent scarlet berries have an excellent flavour[183]. Somewhat sour according to one report[200] whilst another says that they can be inspid or sweetish[161].

tcanta None known
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. This plant has been recommended for improvement by cultivation for its edible fruit[183]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.175 Impatiens noli

Touch-Me-Not

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 1 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Impatiens noli-tangere is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Young shoots - cooked[105, 172]. See the notes above on toxicity. Seed - raw. A delicious nutty flavour but rather difficult to harvest[172], mainly because of their exploding seed capsules which scatter the ripe seed at the slightest touch[K].

tcanta None known
dwatta Antiseptic Diuretic Emetic LaxativeThe plant is antiseptic, diuretic, strongly emetic, laxative and vulnerary[4, 9, 61]. It has been used in the treatment of stranguary and haemorrhoids[4]. The plant is occasionally used internally in the treatment of haemorrhoids and as a laxative and diuretic, but the dose must be carefully adhered to since large quantities are strongly emetic[9]. The plant is harvested at any time in the summer[9].

propta Seed - sow spring in a greenhouse. A period of cold stratification may help to improve germination rates. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it is worthwhile trying an outdoor sowing in situ in the spring or the autumn[4].

nwatta Succeeds in any reasonably good soil[1]. Grows well in heavy clay soils. Prefers a moist well-drained humus rich soil in a cool site[200]. Self sows in areas where the minimum temperature is no lower than -15°C[200]. This plant has seed capsules that spring open forcibly as the seed ripens to eject the seed a considerable distance. The capsules are sensitive to touch even before the seed is ripe, making seed collection difficult but fun[K].

### 6.2.176 Gaylussacia frondosa

Dangleberry, Blue huckleberry
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.8 m hkuc
hmmihmtt cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaylussacia frondosa is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 62]. Sweet and juicy[11, 43, 235], they are good to eat[183]. The fruit is about 8mm in diameter[235].

tcanta None known
dwatta None known

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 1 month warm stratification followed by 2 months cold[113]. When large enough to handle, prick the seedlings out into individual pots of lime-free compost and grow them on in light shade in a greenhouse or cold frame for at least their first winter. Plant out into their permanent positions in late spring or early summer when they are at least 15cm tall. Cuttings of half-ripe wood, July/August in a frame[200]. Layering. Division in spring.

nwatta Requires a lime-free moist peaty soil, thriving in sun or part shade[11, 182]. Prefers partial shade[3]. The fruit is not often produced on plants growing in Britain[11, 182].

### 6.2.177 Hydrangea serrata thunbergii

Tea of heaven, Ama-tsja,
5 tlin 9 cyuc 3 kcaak 2 tcan 0 dwat 1.5 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hydrangea serrata thunbergii is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid,

kcaakta Edible Parts: LeavesEdible Uses: Condi-ment TeaLeaves - raw or cooked. A strong distinctive peppermint-like fragrance[183]. Used as a flavouring in salads or cooked foods[5]. The leaves are too pungent for most people to use as a flavouring[244]. A herb tea is made from the leaves[21, 183].

tcanta Repellent StrewingThe plant repels flies, mice and rats[14, 20, 244]. It has a pleasant, fresh scent and was formerly used as a strewing herb and has been strewn in granaries to keep mice and rats off the grain[14, 244]. The plant, harvested before flowering, yields about 0.8% essential oil[240]. The fresh or dried plant is very good when used in herbal baths and can also be used in herb pillows[244]. Water garden.

dwatta Anodyne Antidiarrhoeal Antiseptic Antispasmodic Astringent Carminative Cholagogue Diaphoretic Emetic Refrigerant Stimulant Stomachic Tonic VasodilatorThe leaves are anodyne, antiseptic, antispasmodic, astringent, carminative, cholagogue, diaphoretic, emetic, refrigerant, stimulant, stomachic, tonic and vasodilator[4, 9, 21]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. It is also used as a mouth-wash and a gargle for treating sore throats, ulcers, bad breath etc[9]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Plants can grow in water up to 15cm deep[24]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The whole plant, especially when bruised, has a pungent aroma of bergamot[245]. The flowers are especially attractive to bees and butterflies[24]. A good companion for brassicas[14]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.166 Amelanchier obovalis

Southern Juneberry, Coastal serviceberry
5 tlin 9 cyuc 3 kcaak 1 tcan 0 dwat 1.5 m hkuc
hmmihmtt cyutli hgattcup hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier obovalis is a deciduous Tree growing to 1.5 m (5ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcaakta Edible Parts: FruitEdible Uses: Fruit, raw or cooked[177]. Sweet and of very good quality, the fruit is eaten out of hand or used in pies, preserves, drinks etc[183]. The fruit is rich in iron and copper[226].

tcanta None known

dwatta None known
propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Plants are stoloniferous[43]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. There is at least one named variety with improved fruits. 'Jennybelle' is a small bush, to 3.5 metres and produces few suckers so is easier to manage[183]. The fruit is up to 12mm in diameter and is sweet even before it is fully ripe. Plants fruit heavily and start to yield when young. They are resistant to drought, frost and high temperatures[183]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of A. lamarckii or Sorbus aucuparia is sometimes practised in order to avoid the potential problem of hybridizing[1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

### 6.2.167 Vaccinium parvifolium

Red Bilberry, Red huckleberry
5 tlin 9 cyuc 3 kcaak 1 tcan 1 dwat 1.8 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium parvifolium is a deciduous Shrub growing to 1.8 m (6ft) by 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked and used in making jams, pies, jellies etc[1, 2, 101, 118, 183, 257]. The fruit can also be dried for later use[183]. An acid flavour, but it is very palatable[11]. The fruit makes a very superior jelly[257]. The fruit is about 12mm in diameter[200]. A tea is made from the dried fruit and leaves[118].

tcanta BroomThe long straight green stems and twigs have been used to make brooms[257].

dwatta Antiseptic Astringent Carminative HypoglycaemicAntiseptic, astringent, carminative, hypoglycaemic[172]. A decoction of the bark has been used in the treatment of colds[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the

last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. A very ornamental plant[60]t. This species is closely related to *V. ovalifolium*[182]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.168 Echinochloa crus

Barnyard Millet, Barnyardgrass,

5 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwssllp hpa7tmwatli xre7t hjonli

drutta Echinochloa crus-galli is a ANNUAL growing to 1.2 m (4ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: CoffeeSeed - cooked[35, 55, 105, 171]. Used as a millet, it can be cooked whole or be ground into a flour before use[183, 257]. It has a good flavour[85] and can be used in porridges, macaroni, dumplings etc[183]. The seed is rather small[159], though fairly easy to harvest. It has a somewhat bitter flavour[178]. Young shoots, stem tips and the heart of the culm - raw or cooked[144, 177]. A nutritional analysis is available[218]. The roasted seed is a coffee substitute[177].

tcanta Soil reclamationThe plant is sometimes used, especially in Egypt, for the reclamation of saline and alkaline areas[269].

dwatta Styptic TonicReported to be preventative and tonic, barnyard grass is a folk remedy for treating carbuncles, haemorrhages, sores, spleen trouble, cancer and wounds[269]. The shoots and/or the roots are applied as a styptic to wounds[218, 240]. The plant is a tonic, acting on the spleen[218, 240].

propta Seed - sow early spring in a greenhouse and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. A sowing in situ in late spring might also succeed but is unlikely to ripen a crop of seed if the summer is cool and wet.

nwatta An easily grown plant, it is adapted to nearly all types of wet places, and is often a common weed in paddy fields, roadsides, cultivated areas, and fallow fields[269]. It succeeds on a variety of wet sites such as ditches, low areas in fertile croplands and wet wastes, often growing in water[269]. It succeeds in cool regions, but is better adapted to areas where the average annual temperature is 14-16°C[269]. Tolerant of most soil types, including saline conditions, plants are not restricted by soil pH[269]. Prefers a rich moist soil[85] but succeeds in ordinary garden soil[1]. The sub-species *E. crus-galli zelayensis* (HBK) Hitchc. is often found growing wild in alkaline soils[236]. The plant is reported to tolerate an annual precipitation in the range of 31 to 250cm, an annual temperature range of 5.7 to 27.8°C and a pH in the range of 4.8 to 8.2[269]. Barnyard millet is sometimes cultivated for its edible seed in India[171]. It has a relatively long growing season and does not always ripen its seed in Britain, though it should do better in the eastern half of the country[K]. The plant is considered to be a very serious weed of many cultivated crops[269].

## 6.2.169 Ephedra nevadensis

Mormon Tea, Nevada jointfir  
5 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 1.2 m hkuc htut cyutli hगत्युत्cup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Ephedra nevadensis is an evergreen Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year; in flower from April to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit SeedEdible Uses: TeaFruit - raw. A sweet but very mild flavour[K]. Seed - cooked[22, 46, 105, 161, 257]. A bitter taste[92]. It can be roasted and ground into a powder and used to make a bread or mush[183]. A delicious tea is made by steeping the green or dried twigs in boiling water until they turn an amber or pink colour[21, 92, 95, 105, 161, 183].

tcanta None known  
dwatta Blood purifier Diuretic Febrifuge Poulitice Tonic VDThe stems are blood purifier, diuretic, febrifuge and tonic[22, 46, 61, 257]. They are beneficial in the treatment of urogenital complaints[22, 46, 61]. An infusion has been used in the treatment of kidney problems, gonorrhoea and the first stages of syphilis[257]. A poultice of the powdered stems has been applied to sores[257]. The stems of most members of this genus contain the alkaloid ephedrine and are valuable in the treatment of asthma and many other complaints of the respiratory system[K]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. Ephedra does not cure asthma but in many cases it is very effective in treating the symptoms and thus making life somewhat easier for the sufferer. The stems can be used fresh or dried and are usually made into a tea, though they can also be eaten raw[K]. The young stems are best if eating them raw, though older stems can be used if a tea is made[K]. The stems can be harvested at any time of the year and are dried for later use[238].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Requires a well-drained loamy soil and a sunny position[1, 11]. Established plants are drought resistant and are also lime tolerant[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.170 Lilium columbianum

Columbia Tiger Lily, Columbia lily, Oregon Lily, Tiger Lily  
5 tlin 10 cyuc 3 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lilium columbianum is a BULB growing to 1.5 m (5ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[61, 105, 161, 213, 257]. The oval-shaped bulb is up to 5cm in diameter and is used as a vegetable in the same way as potatoes (*Solanum tuberosum*) [85, 256]. Starchy, with a slightly sweet taste[85]. The flavour of the cooked bulbs is said to resemble sweet chestnuts but with a slight bitterness[256]. The bulbs were highly prized by various native North American Indian tribes and were used as a staple

food[118, 257].

tcanta None known  
dwatta None known

propta Seed - autumnal hypogeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[163]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division in autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. Stem or leaf cuttings[163].

nwatta Landscape Uses:Border, Massing, Rock garden. Requires a moist not too heavy well-drained acid loam in light shade[47, 143]. Succeeds in full sun[143]. Plant bulbs 10 - 15cm deep[143]. Early to mid autumn is the best time to turn out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Special Features:North American native.

## 6.2.171 Chaerophyllum bulbosum

Turnip-Rooted Chervil  
5 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyafixre7t hjonli

drutta Chaerophyllum bulbosum is a BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root StemEdible Uses: Root - raw or cooked[2, 33, 34, 37, K]. The raw root is rather tough, but has a nice, aromatic, starchy flavour[K]. When cooked it becomes floury and sweet[27] with a peculiar flavour that is excellent and unlike any other vegetable[183]. Peeling the roots ruins the flavour[183]. The root is about the size of a small carrot[2]. It can be harvested when the foliage dies down, usually in July/August from an autumn sowing, and stored like potatoes for later use[1]. It is best harvested as required[164]. The roots contain about 20% starch and 4% protein[74]. Young stems - raw or cooked[74]. Some caution is advised, see notes at the top of the sheet.

tcanta None known  
dwatta None known

propta Seed - best sown in the autumn in situ[33]. The seed has a very short viability[1] or, according to another report, the seed becomes dormant if allowed to dry out and will not germinate for a year[164]. If stored for a spring sowing it should be kept in damp sand in a cold but frost-free place and then sown in situ in March[1]. Another alternative is to sow the seed in the autumn in a seed tray in a cold frame and then to sow the seed, soil and all, in early April in situ[164].

nwatta An easily grown plant, succeeding in almost any soil[1], though it prefers a moist soil[27]. Tolerates a pH in the range 4.6 to 7. The turnip-rooted chervil is occasionally cultivated for its edible root[46, 61], there is at least one named variety[183]. The sub-species *C. bulbosum prescottii* (synonym *C. prescottii*) is used in Russia[74]. The root of this sub-species contains about 17% starch[74].

## 6.2.172 Lepidium latifolium

Dittander, Broadleaved pepperweed  
5 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisom hpa7tmwatli xre7t hjonli

drutta Lepidium latifolium is a PERENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: CondimentYoung leaves - raw or cooked[2, 61, 74]. A very hot cross-like flavour[K]. The leaves are nice when used in small quantities as a flavouring in salads[K]. Some reports also suggest using them as a potherb[183], though they have always seemed to be too strong for us to want to try this[K]. The leaves are available very early in the year[K]. Root - it can be grated and made into a sauce which is used as a horseradish substitute[2, 5, 183]. It has a pungently hot flavour. Seed - used as a condiment[177, 183].

tcanta InsecticideUsed as an insecticide[100]. No further details are given, but it is likely to be a strong infusion of the leaves and stems that is used.

dwatta Antiscorbutic Depurative Hepatic Kidney Resolvent StomachicThe plant is antiscorbutic, depurative and stomachic[61, 240]. An infusion of the plant is used in the treatment of liver and kidney diseases, it increases cardiac amplitude, decreases frequency and regulates the rhythm[240]. It is also used as a resolvent in the treatment of skin diseases[240].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the spring. Division in spring. Plant them out direct into their permanent positions. Division is very simple and succeeds at almost any time of the year[K].

nwatta A very easily grown plant, it succeeds in most soils in sun or light shade. Plants have been surviving quite happily with us, and are still spreading freely, in dense grass that is rarely cut[K]. Dittander was formerly cultivated as a food condiment in Britain and in ancient Greece[17, 183]. It is a very invasive plant, capable of spreading more than a metre per year by means of its aggressive root system[K]. It produces new growth early in the year and so can be a useful salad ingredient in late winter[K].

## 6.2.173 Osmorhiza claytonii

Woolly Sweet-Cicely, Clayton's sweetroot  
5 tlin 9 cyuc 3 kcaak 1 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyafixre7t hjonli

drutta Osmorhiza claytonii is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: CondimentRoot - cooked and eaten as a vegetable[46, 105, 183]. Used for putting on weight[61, 161]. Leaf stalks - cooked and used as a vegetable[183]. The aromatic roots and unripe seeds are used as anise-like flavourings[183]. Pleasant to chew[207].

tcanta Scented.

dwatta Ophthalmic PouliticeThe root has been chewed or gargled as a treatment for sore throats[222, 257]. A poultice of the moistened pulverized roots has been applied to boils, cuts, sores etc whilst a tea made from the roots has been used to bathe sore eyes[222, 257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if

in a cold frame in early spring. Division of offsets in September/October[200]. The larger bulbs can be replanted immediately into their permanent positions. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in late summer.

nwatta An easily grown plant, succeeding in ordinary garden soil[1, 42], thriving in sun or shade[42]. Succeeds in dry soils and, once established, is drought tolerant[190]. Plants are hardy to about -20°c[200]. Grows well in the wild garden[200]. The flowering shoots used to be sold as a food crop in Bath market[183].

### 6.2.394 Cardamine kitaibelii

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli fyifxre7t hjonli

drutta Cardamine kitaibelii is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[K]. A mild cabbage flavour with a hint of cress[K]. Flowers - raw[K]. A mild cabbage flavour with a hint of cress[K].

tcanta None known
dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°c[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moist humus rich soil in shade or semi-shade[200] but succeeds in most soils that are not dry[1]. This species was seen growing and thriving in well-drained soil in a lightly shaded position at Kew[K].

### 6.2.395 Arctostaphylos nevadensis

Pine-Mat Manzanita
5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.1 m hkuc hmimhtut cyutli tucp hwicli hrasjlut hpa7tli frusflat hpa7tmwatli fyifxre7t hjonli

drutta Arctostaphylos nevadensis is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Seed - ground into a powder and added to soups etc[92]. The seed is very small and would be difficult to separate from the fruit. It would be easier to dry the whole fruit, grind this into a powder and use it in soups etc[K]. Fruit[92, 105, 161]. The fruit can be eaten fresh or dried and stored for later use[257]. It can also be pulverised and made into a drink[257].

tcanta DyeA yellowish-brown dye is obtained from the leaves, it does not require a mordant[168]. A good ground-cover plant for steep sandy banks[28, 200]. A carpeting plant, growing quite rapidly and rooting as it spreads[208].

dwatta Astringent SkinThe leaves are used in the treatment of diarrhoea[257]. The whole plant is used as an

antidote for poisoning by poison oak, Toxicodendron diversiloba[257]. It was probably applied externally to the skin[K].

propta Seed - best sown in a greenhouse as soon as it is ripe. Pre-soak dried seed in boiling water for 10 - 20 seconds or burn some straw on top of them and then stratify at 2 - 5°c for 2 months[11, 200]. The seed usually germinates in 2 - 3 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or greenhouse for at least their first winter. Plant out in late spring or early summer. Cuttings of side shoots of the current season's growth, 5 - 8cm with a heel, August to December in a frame. Takes one year[1, 78]. Division in early spring. Take care because the plant resents root disturbance. Pot the divisions up and keep them in a lightly shaded position in a cold frame or greenhouse until they are growing away actively. Layering in spring[200].

nwatta Requires a deep moist well-drained light or medium lime-free loam in sun or semi-shade but plants produce less fruit when grown in the shade[200]. Prefers a position in full sun[11]. Grows well in shade[28]. Plants at Kew were growing very well in a shady position on a NE slope in 1990[K]. Grows well in a sandy seashore garden[208]. This species is closely related to A. uva-ursi[11, 60]. Plants resent root disturbance and should be placed in their final positions as soon as possible[134].

### 6.2.396 Lycoris sanguinea

Spider Lily
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc htut cyutli tucp hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lycoris sanguinea is a BULB growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. It is used as a source of starch[105, 177]. The bulb is 2.5cm in diameter[200]. Caution is advised, see the notes above on toxicity.

tcanta None known
dwatta None known

propta The seed is best sown as soon as it is ripe in a greenhouse and should germinate in the spring[200]. Sow the seed thinly so that it does not need to be disturbed for its first year of growth. Give an occasional liquid feed during the growing season to ensure the plants do not become nutrient deficient. Pot up the small bulbs when the plants become dormant, placing 2 bulbs in each pot. Grow them on for another 2 years in the greenhouse before planting them out when they are dormant. Division of offsets in the dormant season[200].

nwatta Requires a deep well-drained sandy soil rich in organic matter in full sun[200]. This species is hardy to at least -15°c[200]. Other reports say that the bulb tolerates soil temperatures down to about -5°c[214, 260]. This is a difficult plant to grow outdoors in temperate areas, the plant comes into growth in late summer, flowers in the autumn and the leaves then persist until the following summer when the plant will have a short period of dormancy. These leaves can be killed by hard frosts and, should this happen often, the bulb will be weakened and killed[200, 260]. Plants therefore require a sheltered position to avoid damage to the growing leaves in the winter[200]. Plants need a warm period in late summer in order to ripen the bulbs and induce flowering in the following year[188]. Plants are attractive to slugs and need to be protected from them[200]. Very sensitive to root disturbance, the bulbs can take some years to become well established[200].

### 6.2.397 Vaccinium japonicum

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.7 m hkuc hmimhtut cyutli tucp hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

in Britain, it is also a food plant for the caterpillars of many species of butterfly[30], there are 284 insect species associated with this tree[24]. Trees were often coppiced or pollarded in the past for their wood[186], though this is best done on a long rotation of perhaps 50 years. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Older trees have a thick corky bark and this can protect them from forest fires, young trees will often regenerate from the base if cut down or killed back by a fire[186]. Trees transplant badly unless moved regularly[11]. Hybridizes freely with other members of the genus[200]. Immune to attacks by the Tortix moth[1]. This species is notably resistant to honey fungus[88, 200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

#### 6.2.241 Fraxinus excelsior

Ash, European ash, Common Ash
5 tlin 8 cyuc 2 kcaak 3 tcan 2 dwat 30 m hkuc htut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Fraxinus excelsior is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf from May to October, in flower from April to May, and the seeds ripen from September to January. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Manna Oil SeedEdible Uses: Oil Tealmmature seed - usually pickled by steeping in salt and vinegar, and then used as a condiment for other foods[2, 8, 66, 183]. The leaves are sometimes used as an adulterant for tea[2, 177, 183]. A manna is obtained from the tree[183]. No further details are given. An edible oil similar to sunflower (Helianthus annuus) oil is obtained from the seed[7].

tcanta Dye Fuel Oil Shelterbelt String Tannin WoodA green dye is obtained from the leaves[7]. The bark is a source of tannin[4]. A tying material can be obtained from the wood[6] (does this mean the bark?). Very tolerant of extreme exposure and relatively fast growing, though often windshaped in exposed positions, it can be grown as a shelterbelt tree[49, 200]. However, it is late coming into leaf and also one of the first trees to lose its leaves in the autumn and this makes it less suitable in a shelter belt. Wood - hard, light, flexible, strong, resilient. A very valuable wood, it is much used for tool handles, oars, furniture, posts etc[4, 6, 7, 13, 46, 66]. An excellent fuel, burning well even when green[6]. There is some doubt over how well the green wood burns with several people claiming that it needs to be properly seasoned[K].

dwatta Antiperiodic Astringent Carminative Cathartic Diaphoretic Diuretic Laxative Purgative TonicThe leaves are astringent, cathartic, diaphoretic, mildly diuretic, laxative and purgative[4, 7, 9, 13, 21, 165, 254]. The have been used as a laxative, making a mild substitute for senna pods[254]. The leaves should be gathered in June, well dried and stored in airtight containers[4]. The bark is antiperiodic, astringent and a bitter tonic[4, 240]. Little used in modern herbalism, it is occasionally taken in the treatment of fevers[254]. The seeds, including their wings, have been used as a carminative[4]. They will store for 12 months if gathered when ripe[4].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Approximately 5% of stored seed will germinate in the first year, the remainder germinating in the second year[186]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in

late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds. Cuttings of mature wood, placed in a sheltered outdoor bed in the winter, sometimes strike.

nwatta Landscape Uses:Firewood, Pollard, Specimen. Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[1, 200]. Plants can succeed in very exposed positions, including maritime exposure, though they can become wind-shaped[49]. Thrives in alkaline soils[11] but not in shallow soils over chalk. Tolerates a pH as low as 4.5, but prefers a base-rich soil above 5.5[186]. Trees are surprisingly tolerant of seasonally water-logged soils[186]. Dislikes dryness at the roots, especially in late spring[186]. Very intolerant of shade, young plants fail to develop properly in such a position and often die. Although the dormant plant is very cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A fast growing tree, it is sometimes cultivated for its valuable timber. Very tolerant of cutting, ash was also at one time frequently coppiced for its wood[186]. However, modern use of plastics have reduced its economic values. There are many named varieties, selected for their ornamental value[11]. Trees have a light canopy and cast little shade[186]. A food plant for many insect species, there are 41 associated insect species[24, 30]. Trees can be male, female, monoecious or hermaphrodite, they can also change sex from year to year[11]. Trees take 30 - 40 years to flower from seed[186]. The flowers are produced on one-year old wood[7]. This species is notably resistant to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 6.2.242 Pinus wallichiana

Himalayan Blue Pine, Bhutan pine, Himalayan Pine
5 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 25 m hkuc htut cyutli hgatkycutcup hwicli hyishrasjlutnyikprik hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus wallichiana is an evergreen Tree growing to 25 m (82ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from May to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Manna SeedEdible Uses: CondimentSeed - raw or cooked[183]. It has a very resinous flavour and so is not much relished[158]. The seed is quite small, to 7mm long[200]. The honyewood from aphid infested leaves is eaten as a manna[51, 146, 158]. Another report says that a manna-like substance that exudes from the leaves and twigs is eaten or used like honey[183]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Fuel Herbicide Lighting Pitch Shelterbelt Stuffing WoodA commercial source of turpentine and tar. It is said to be superior to P roxburghii but not produced so freely[64, 146, 158]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Tur-

pentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The leaves are used as a stuffing for pillows etc[158]. A tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Wood - moderately hard, durable, highly resinous. Used in construction, carpentry etc[46, 51, 146, 158, 272]. A good firewood but it gives off a pungent resinous smoke[51]. The wood is rich in resin. It can be splintered and used as a torch[145, 158].

dwatta Antiseptic Diaphoretic Diuretic Rubefacient Stimulant VermifugeThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. The wood is diaphoretic and stimulant[240]. It is useful in treating burning of the body, cough, fainting and ulcers[240].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Industrial Crop: Hydrocarbon Management: Standard Regional CropLandscape Uses:Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils or shade[1, 11]. Established plants tolerate drought[200]. Prefers sandy or clay soils rather than limestone[146]. A very hardy but relatively short-lived tree in cultivation[11]. The Himalayan blue pine succeeds in exposed positions but it looks much better when grown in a sheltered position[11, 81]. It is a very fast growing tree when young, with new shoots up to 1metre long per year[11] and 30 year old trees 20 metres tall. New growth takes place from April to mid-July[185]. Growth in height diminishes rapidly when trees are 25 metres tall, probably due to their dislike of exposure at that height[185]. Cultivated for timber in Italy[50]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Cones open and shed their seed whilst still on the tree[1]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 6.2.243 Aesculus x carnea

Red Horse Chestnut, Ruby Red Horsechestnut  
5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 25 m hkuc  
pcimhmhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aesculus x carnea is a deciduous Tree growing to 25 m (82ft 0in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: SeedEdible Uses: We have no details for this species, but the following notes almost certainly apply to it. Seed - cooked. It can be dried, ground into a flour and used as a gruel. The seed is quite large, about 20mm in diameter, and is also easily harvested. Unfortunately, it is rich in saponins and these toxins need to be removed before the seed can be eaten. See also the notes above on toxicity. The following notes apply to *A. californica*, but are probably also relevant here: - The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213]. Most of the minerals etc would also have been leached out by this treatment[K].

tcanta SoapSaponins in the seed are a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chest-nuts[K].

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Excessive fear' and 'Anxiety for others'[209].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer. This species is a garden hybrid though it breeds relatively true from seed[200].

nwatta Landscape Uses:Pest tolerant, Pollard, Specimen, Street tree. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. The dormant tree tolerates temperatures down to at least -15°C[200], though the young growth in spring can be damaged by late frosts. It prefers a continental climate, growing best in eastern and south-eastern England[200]. There are some named forms selected for their ornamental value[11, 200]. Most members of this genus transplant easily, even when fairly large[11]. Abnormal cell development in this species may result in eruptions on trunks over 30cm in diameter - these ultimately decay[200]. Although a hybrid species, it breeds true from seed due to a doubling of the chromosomes[11, 17]. Special Features:Attractive foliage, Not North American native, Blooms are very showy.

## 6.2.244 Abies lasiocarpa

Subalpine Fir, Alpine Fir  
5 tlin 6 cyuc 2 kcaak 0 tcan 2 dwat 25 m hkuc  
pcimhmimhtut cyutli tcup hwicli hyishrasjltunykifrip hpa7tli flatprik hpa7tmwatli hjonli

drutta Abies lasiocarpa is an evergreen Tree growing to 25 m (82ft) by 4 m (13ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Inner bark Seed SeedpodEdible Uses: Gum Gum TeaThe shoot tips are used as a tea substitute[177, 183]. The cones can be ground into a fine powder, then mixed with fat and used as a confection[257]. It is

nwatta Succeeds in any good soil[187]. Prefers a well-drained light rich or peaty soil[1, 200]. Requires a moist peaty soil and a sunny position[111, 134]. A good bee plant[50, 74]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134].

## 6.2.390 Gaultheria pyrolifolia

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasjltut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaultheria pyrolifolia is an evergreen Shrub growing to 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is about 8mm in diameter[200].

tcanta None known  
dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[K]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them out in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moist but not boggy humus rich soil in shade or semi-shade[11, 182]. A peat and moisture loving species, it requires a lime-free soil[11, 182]. Plants in this genus are notably resistant to honey fungus[200]. This species has been confused in the past with *G. pyroloides*, a distinct species from Japan[266].

## 6.2.391 Atraphaxis spinosa

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hyishras hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Atraphaxis spinosa is a deciduous Shrub growing to 0.6 m (2ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: MannaEdible Uses: The plant is a source of a yellowish-white manna-like substance that is eaten as a food or used in making sweetmeats[183].

tcanta None known  
dwatta None known

propta Seed - sow spring in a greenhouse[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Seedlings are prone to damp off so should be watered with care and kept well ventilated[200]. Cuttings of soft wood in early summer in a frame[200]. Layering in spring[200].

nwatta Requires a sunny position in a light well-drained soil of low to moderate fertility[182, 200]. Succeeds in the rock garden or on a sunny stony bank[200]. Plants are hardy to at least -10°C so long as the soil is not wet over the winter[200]. The tiny flowers have long lasting petals[182]. This species is closely related to *A. frutescens*[200]. Any pruning should be restricted to the removal of branch tips every second or third year during the spring in order to maintain a neat compact habit[200]. Established specimens resent root disturbance[200].

## 6.2.392 Samolus valerandi

Brookweed, Seaside brookweed

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli tcupha7nhs6w hwicli hrasjltunyk hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta Samolus valerandi is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil and can grow in water. The plant can tolerate maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[46, 61]. A rather bitter flavour[K].

tcanta None known  
dwatta AntiscorbuticThe leaves are antiscorbutic[46, 61].

propta Seed - surface sow in a cold frame in the spring, standing the pot in about 3cm of water. Prick out the seedlings when they are large enough to handle and gradually increase the depth of water as the plants grow until it is level with the tops of the pots. Plant out in the summer if there has been sufficient growth, otherwise plant out in late spring of the following year. Division in spring.

nwatta Succeeds in ordinary garden soil in a wet position or in shallow water[1, 200]. Dislikes shade or acid soils.

## 6.2.393 Ornithogalum pyrenaicum

Bath Asparagus, Pyrenees star of Bethlehem  
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ornithogalum pyrenaicum is a BULB growing to 0.6 m (2ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. kcaakta Edible Parts: Leaves StemEdible Uses: Young shoots - cooked[1, 5, 46, 61]. The young, unexpanded flowering shoots are cooked and served like asparagus[2, 4, 17, 177, 183].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Sow the seed thinly and leave the seedlings undisturbed in the pots for their first dormancy, but apply liquid feed at intervals, especially in their second year of growth. Divide the bulbs at the end of their second year of growth, putting 2 - 3 bulbs in each pot. Grow them on for one more year and then plant them out into their permanent positions whilst they are dormant. The seed can also be sown



shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are found on alkaline soils in the wild[43]. Plants are hardy to at least -15°C[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200].

## 6.2.388 Sedum spectabile

Ice Plant

5 tlin 9 cyuc 2 kcaak 3 tcan 1 dwat 0.4 m hkuc htut cyutli hgtakuyctcup hwicli hyhisrasjltunyk hpa7tli flatprikliw hpa7tmwatli fyfixre7t hjonli

drutta Sedum spectabile is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kckaata Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[105]. The leaves are very mucilaginous but have a fairly bland flavour[K].

tcanta Plants can be grown as a ground cover when planted about 30cm apart each way[208].

dwatta Antiphlogistic Depurative SialagogueThe plant is antiphlogistic, depurative, sialagogue[147].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Cuttings at almost any time in the growing season. Very easy, even a single leaf will produce roots and form a new plant.

nwatta A very easily grown and tolerant plant, it succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Tolerates poor soils[233]. Established plants are drought tolerant[200], they can also tolerate considerable neglect, surviving even in the dense growth of weeds[K]. Plants are hardy to about -20°C[187]. This species has pink flowers[200]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. The flowers have a honey-like smell similar to Buddleias[245]. A very ornamental plant[1], there are some named varieties[187]. The flowers are very attractive to bees and lepidoptera[30]. Plants in this genus seem to be immune to the predations of rabbits[233]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 6.2.389 Asclepias pumila

Low Milkweed, Plains milkweed

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Asclepias pumila is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckaata Edible Parts: Flowers Leaves Oil Oil Seed See Uses: Gum Oil Oil SweetenerThe following reports refer to other members of this genus and are possibly also appropriate for this species[K]. Unopened flower buds - cooked. They taste somewhat like peas. They are used like broccoli[183]. Flowers and young flower buds - cooked. Used as a flavouring and a thickener in soups etc[55, 102]. The flower clusters can be boiled down to make a sugary syrup[2, 85]. The flowers are harvested in the early morning with the dew still on them[95]. When boiled up it makes a brown sugar[95]. Young shoots - cooked. An asparagus substitute[2, 4, 43, 55, 62, 95, 183]. They should be used when less than 20cm tall[159]. A slightly bitter taste[159]. Tips of older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long, cooked[2, 43, 55, 85]. They are very appetizing. Best used when about 2 - 4cm long and before the seed floss forms, on older pods remove any seed floss before cooking them[85, 159]. If picked at the right time, the pods resemble okra[183]. The sprouted seeds can be eaten[183]. An edible oil is obtained from the seed[55, 171]. The latex in the stems is made into a chewing gum[46, 61]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112].

tcanta Fibre Gum Latex Oil Oil Pollution Stuffing Wick-The following reports refer to other members of this genus and are possibly also appropriate for this species[K]. A good quality fibre is obtained from the bark, used in making twine, cloth, paper etc[95, 112, 169]. It is of poor quality in wet seasons[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[112, 159, 169, 171]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[112]. Very water repellent, it can yield up to 550 kilos per hectare[112]. The floss has also been used to mop up oil spills at sea. Candlewicks can be made from the seed floss[112, 207]. Rubber can be made from latex contained in the leaves and the stems[46, 57, 102, 159]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112]. Pods contain an oil and a wax which are of potential importance. The seed contains up to 20% of an edible semi-drying oil[74, 112]. It is also used in making liquid soap[74].

dwatta AstringentAn infusion of the leaves is used in the treatment of diarrhoea, the remedy can be given to children[257].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

said to be a delicacy and an aid to the digestion[257]. The resin from the trunk is used as a chewing gum[257]. It is said to treat bad breath[257]. Inner bark[257]. No more information is given, but inner bark is often dried, ground into a powder and then used with cereal flours when making bread etc[K]. Seeds[257]. No more information is given, but the seeds are very small and fiddly to use. Seeds of this genus are generally oily with a resinous flavour and can be eaten raw or cooked[K].

tcanta Baby care Deodorant Gum Gum Hair Incense Miscellany Repellent WoodThe fragrant young leaves and twigs are used to repel moths or are burnt as an incense[46, 61, 169, 257]. They were also ground into a powder and used to make a baby powder and perfumes[226, 257]. A gum is obtained from the bark. It is antiseptic[46, 61] and was chewed by the N. American Indians in order to clean the teeth[226]. It was also used to plug holes in canoes[226]. An infusion of the leaves is used as a hair tonic[257]. The leaves can also be placed in the shoes as a foot deodorant[257]. Wood - light, soft, not strong. It is little used except as a fuel and for pulp[46, 61, 82]. The native North American Indians used it for making chairs and insect-proof storage boxes[257]. It was also used as a fuel and was said to burn for a long time[257].

dwatta Antihalitosis Antiseptic Deodorant Emetic Foot care Laxative Miscellany Poultice TB TonicAntiseptic[46, 61]. The gummy exudate that appears on the bark was soaked in water until soft and then applied to wounds[213]. An infusion of the resin has been used as an emetic to cleanse the insides[257]. The resin has also been chewed to treat bad breath[257]. A decoction of the bark is used as a tonic and in the treatment of colds and flu[257]. A poultice of the leaves has been used to treat chest colds and fevers[257]. An infusion has been taken to treat the coughing up of blood, which can be the first sign of TB, and as a laxative[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Landscape Uses:Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Very shade tolerant, especially when young, but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. Occasionally planted for timber in N. Europe[50] but this species does not thrive in Britain[11]. It is a very cold-hardy tree but the milder winters of this country make it susceptible to damage by aphid and late frosts[1, 11, 81]. The sub-species A. lasiocarpa arizonica. (Merriam.) Lemmon. is growing somewhat better here[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The crushed foliage has a balsam aroma[185]. Special Features:North American native, There are no flowers or blooms.

## 6.2.245 Liquidambar styraciflua

Sweet Gum, Red Gum, American Sweet Gum, Red Sweet Gum,

5 tlin 9 cyuc 2 kcaak 3 tcan 3 dwat 25 m hkuc htut cyutli tcup hwicli hrasjltunyk hpa7tli flatprik hpa7tmwatli hjonli

drutta Liquidambar styraciflua is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a fast rate. See

above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kckaata Edible Parts: Edible Uses: GumA chewing gum and a stabilizer for cakes etc is obtained from the resin[102, 105, 149, 159]. It can also be chewed to sweeten the breath[183].

tcanta Adhesive Gum Incense Parasiticide Resin Teeth WoodThe aromatic resin 'Storax' is obtained from the trunk of this tree[46, 57, 61, 64]. It forms in cavities of the bark and also exudes naturally. It is harvested in autumn[181, 238]. Production can be stimulated by beating the trunk in the spring[171, 238]. The resin has a wide range of uses including medicinal, incense, perfumery, soap and as an adhesive[149]. It is also chewed and used as a tooth cleaner[183]. Wood - heavy, fairly hard, fine-grained, not strong, light, tough, resilient. It weighs about 37lb per cubic foot[227]. The wood takes a high polish and can be stained then used as a cherry, mahogany or walnut substitute[171]. It is also used for furniture, flooring, fruit dishes, veneer etc[46, 61, 82, 149, 227].

dwatta Antiseptic Astringent Carminative Cholera Diuretic Dysentery Expectorant Parasiticide Poultice Salve Sedative Stimulant VulneraryA resin obtained from the trunk of the tree (see 'Uses notes' below) is antiseptic, carminative, diuretic, expectorant, parasiticide, poultice, salve, sedative, stimulant, vulnerary[21, 46, 57, 61, 149, 171, 213, 218, 222, 238]. It is chewed in the treatment of sore throats, coughs, asthma, cystitis, dysentery etc[222, 238, 257]. Externally, it is applied to sores, wounds, piles, ringworm, scabies etc[222, 238]. The resin is an ingredient of 'Friar's Balsam', a commercial preparation based on Styrax benzoin that is used to treat colds and skin problems[238]. The mildly astringent inner bark is used in the treatment of diarrhoea and childhood cholera[222].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Harvest the seed capsules at the end of October or November, dry in a warm place and extract the seed by shaking the capsule. Stored seed requires 1 - 3 months stratification and sometimes takes 2 years to germinate. Sow it as early in the year as possible. Germination rates are often poor. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse for their first winter. Since they resent root disturbance, it is best to plant them out into their permanent positions in early summer of their second year and give them some protection from cold for their first winter outdoors[K]. Cuttings of half-ripe wood, July/August in a frame. Suckers in early spring. Layering in October/November. Takes 12 months.

nwatta Landscape Uses:Aggressive surface roots possible, Specimen, Street tree. Prefers a moist but not swampy loam in a sunny sheltered position[11, 200]. Succeeds in light shade[188]. Prefers a neutral to acid soil[130]. Plants grow poorly in shallow soils overlying chalk[188]. Young plants are susceptible to damage from late frosts. A highly ornamental plant, especially in its autumn foliage[1, 227], it grows well in Cornwall[59] and S. England but does not do well in the north[98]. A fast-growing and long lived tree, it is fairly free from pests and diseases and has the potential to be a re-afforestation tree in cutover lands[227]. Trees commence flowering when about 20 - 25 years old[229]. The leaves emit a balsam-like fragrance when they fall in the autumn, this is retained until the leaves are quite withered[245]. Plants in the north of their range do not produce much resin[183]. Resists honey fungus[88]. This species resents root disturbance, young plants should be pot-grown and be placed in their permanent positions as soon as possible[200]. Special Features:Attractive foliage, North American native, Invasive, Naturalizing, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 6.2.246 Corylus chinensis

Chinese Hazel

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 24 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli fyif hjonli

drutta Corylus chinensis is a deciduous Tree growing to 24 m (78ft 9in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[63, 105, 177, 183]. Rich in oil. A shrub at Kew was 2 metres tall and 2 metres wide in July 1996 with a reasonable crop of immature fruit[K]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed,

tcanta OilNone known

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°C[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200]. Division of suckers in early spring. Very easy, they can be planted out straight into their permanent positions.

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wind tolerant[1, 11]. Once established, this species is drought resistant[183]. It does not produce suckers[183]. A very ornamental tree[1], it is closely allied to *C. colurna*[11]. It has become very rare in China where it is considered to be at risk of extinction[266]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 6.2.247 Quercus nigra

Water Oak

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus nigra is a deciduous Tree growing to 20 m (65ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[61, 105, 161]. A staple food for some native North American Indian tribes[257]. The seed is about 15cm long and wide[82, 200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for

making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute[257].

tcanta Fuel Repellent Tannin Woodd mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - heavy, hard, strong, close-grained[61, 82, 227, 235]. It weighs 45lb per cubic foot[235]. It is used for cross-ties and poles[227], but is little valued except as a fuel[61, 82].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A fast-growing tree in its native habitat, it does not bear seeds until about 20 years old[229]. Seed production is cyclic, a year of high yields being followed by a year of low yields[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.248 Aesculus turbinata

Japanese Horse Chestnut

5 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aesculus turbinata is a deciduous Tree growing to 20 m (65ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves cooked[177]. Some caution is advised on this entry since the leaves are likely to contain toxic saponins (see notes above on toxicity). Seed - cooked. It can be dried, ground into a flour and used as a gruel. The starch is extracted and eaten[177]. The seed is quite large, about 25 - 30mm in diameter, and is easily harvested. Unfortunately it is also rich in saponins and these need to be removed before the seed can be eaten. See also the notes above on toxicity. The following notes apply to *A. californica*, but are probably also relevant

interesting chemistry, but it is seldom used in modern practice[238]. The whole plant is antiphlogistic, antipyretic, antitussive and expectorant[9, 61, 147, 178, 218]. An overdose of the plant is said to easily precipitate an abortion[218]. The fruit is aperient, strongly diuretic and lithontrpic[4, 7, 9, 218]. It is used internally in the treatment of gravel, suppression of urine etc and is highly recommended in fevers and in gout[4, 238]. The fruit is harvested when fully ripe and can be used fresh, juiced or dried[238]. The calyx should be removed[238]. The leaves and stems are febrifuge and slightly tonic[4]. They are used in the treatment of the malaise that follows malaria, and for weak or anaemic people[4]. The fresh leaves have been used externally in the treatment of skin inflammations[238]. The seed is used to promote early labour[218]. A homeopathic remedy is made from the fruit. It is used in the treatment of kidney and bladder disorders[9].

propta Seed - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out in early summer. Diurnal temperature fluctuations assist germination[170]. Division in spring[111]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in early summer[111]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any well-drained soil in full sun or light shade[111, 200]. The fully dormant plant is hardy in most of Britain, though the young growth in spring can be damaged by late frosts. A very ornamental plant[1] though it can be invasive[200]. This sub-species, which is sometimes treated as a separate species, is a more vigorous form of *P. alkekengi* with larger fruits[200]. Slugs are very fond of the new growth in spring and can destroy even quite large clumps[K].

## 6.2.385 Salvia verbenaca

Wild Clary

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli hgatkuyctcup hwicli hrasjlut hpa7tli priklwis hpa7tmwatli fyifxre7t hjonli

drutta Salvia verbenaca is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. They are most often used as a flavouring in cooked foods. They are aromatic. The young leaves can be eaten fried or candied[183]. A herb tea is made from the leaves, it is said to improve the digestion. Flowers - raw. A flavouring in salads[177, 183].

tcanta None known

dwatta OphthalmicThe seed forms a thick mucilage when it is soaked for a few minutes in water. This is efficacious in removing small particles of dust from the eyes[4].

propta Seed - sow March/April in a greenhouse. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Division in spring.

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants can be killed by excessive winter wet[200]. This species is

well suited to the wild garden, growing well in the summer meadow[200]. A good bee plant[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.386 Bidens tripartita

Burr Marigold, Threelobe beggarticks

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Bidens tripartita is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, hover-flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177, 183].

tcanta Dye RepellentYields a black dye[178]. The part of the plant that is used is not specified. The burning herb repels insects and flies[268]. The flowers yield a yellow dye of indifferent quality when alum is used as a mordant[4, 115, 268].

dwatta Antiseptic Aperient Astringent Diuretic Emmenagogue Febrifuge Narcotic Sedative StypticBurr marigold is little used as a medicine nowadays, but it was once esteemed for its styptic properties being used to quickly staunch blood flow - it was often used to treat uterine haemorrhage and conditions producing blood in the urine[254]. The whole plant is antiseptic, aperient, astringent, diuretic, emmenagogue, febrifuge, narcotic, sedative, styptic and sudorific[4, 61, 165, 218]. It is an excellent remedy for ruptured blood vessels and bleeding of any kind, and is of benefit to people with consumption[4]. It is used internally to treat bladder and kidney problems, blood in the urine, uterine bleeding, ulcerative colitis and peptic ulcers[238, 254]. Externally, it is used in the treatment of alopecia[238]. It is usually combined with a carminative herb such as ginger when used to treat digestive tract ailments[254]. The plant is harvested as it comes into flower and is dried for later use[238].

propta Seed - sow in situ during early spring and only just cover the seed. So long as the soil does not dry out, the seed usually germinates in 2 - 3 weeks at 15°C[134].

nwatta Succeeds in any moderately fertile damp to wet soil in full sun[200, 238]. The flowering heads smell like rosin or cedar when they are burnt[4]. The seed coats have reflexed prickles which allow them to adhere to clothing, animal fur etc[4]. When growing on the edge a pond, these seeds have been known to kill goldfish by adhering to their gills[4].

## 6.2.387 Asarum reflexum

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Asarum reflexum is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe underground stem is a ginger substitute. The root has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic[245]. It is usually harvested in the autumn[159, 177] and can be dried for later use[K].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light

## 6.2.381 *Arum italicum*

Italian lords and ladies, Italian Arum  
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.4 m hkuc  
pcimhmimhtut cyutli kyuctupc hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Arum italicum* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Tuber - cooked and used as a vegetable[2, 177]. An arrowroot can be extracted from the dried root[105]. The root must be thoroughly dried or cooked before being eaten, see the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Seed - best sown in a greenhouse or cold frame as soon as it is ripe[134]. The seed usually germinates in 1 - 6 months at 15°C[134]. Stored seed should be sown in the spring in a greenhouse and can be slow to germinate, sometimes taking a year or more. A period of cold stratification might help to speed up the process. Sow the seed thinly, and allow the seedlings to grow on without disturbance for their first year, giving occasional liquid feeds to ensure that they do not become mineral deficient. When the plants are dormant in the autumn, divide up the small corms, planting 2 - 3 in each pot, and grow them on in light shade in the greenhouse for a further year, planting out when dormant in the autumn. Division of the corms in summer after flowering[200]. Larger corms can be planted out direct into their permanent positions, though it is best to pot up the smaller corms and grow them on for a year in a cold frame before planting them out.

nwatta Landscape Uses:Border, Container, Rock garden, Woodland garden. Prefers a humus rich soil and abundant water in the growing season[1]. Succeeds in sun or dry shade[90], preferring a shady position[4, 17, 31] and growing well in woodland conditions[1]. A polymorphic species[200], the British form has been separated off by some botanists as *A. neglectum*[17]. The leaves appear in the autumn, the plant staying green all winter[1, K]. The inflorescence has the remarkable ability to heat itself above the ambient air temperature to such a degree that it is quite noticeable to the touch[4]. This probably protects the flowers from damage by frost, or allows it to penetrate frozen ground. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, Naturalizing, All or parts of this plant are poisonous.

## 6.2.382 *Ribes ambiguum*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Ribes ambiguum* is a deciduous Shrub growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 177]. An acid flavour[105], they are commonly eaten in areas where they grow wild[2]. A reasonable size, the green fruit can be 12mm in diameter[2, 266].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 0 - 9°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out

the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Quite tolerant of shade though not fruiting so well in such a position[11]. Prefers a cool sheltered position in a leafy soil[11]. Hardy to about -20°C[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.383 *Athamantha turbith*

Candy Carrot  
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Athamantha turbith* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[2, 105, 177]. No more details are given.

tcanta None known  
dwatta None known  
propta Seed - sow spring in a cold frame[1]. Germination usually takes place within 3 - 6 weeks at 13°C[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can also be sown in situ as soon as the soil is workable in the spring[134]. Division in spring, with care[200].

nwatta An easily grown plant, succeeding in most well drained fertile soils in a sunny position[1, 200, 233]. The long tap root is susceptible to rot in wet winters[200].

## 6.2.384 *Physalis alkekengi franchetii*

Winter Cherry  
5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Physalis alkekengi franchetii* is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[1, 2, 4, 7, 105]. The plant conveniently wraps up each fruit in its own 'paper bag' (botanically, the calyx) to protect it from pests and the elements. This calyx is toxic and should not be eaten[34, 65]. Rich in vitamins[100], with twice the vitamin C of lemons[179], but not much taste[178]. We have found them to be bitter and rather unpleasant[K]. Young leaves - cooked[105, 170, 179]. Caution is advised, the leaves are almost certainly poisonous, at least when raw.

tcanta Plants spread rapidly by their roots and can be grown as a ground cover[208]. They are best spaced about 1 metre apart each way[208].

dwatta Aperient Diuretic Expectorant Febrifuge Malaria Vitamin CThe plant has a long history of herbal use, and an

here:- The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213]. Most of the minerals etc would also have been leached out by this treatment[K].

tcanta Soap WoodSaponins in the seed are a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Wood - weak, nicely grained. Used for house fittings, domestic items etc[11].

dwatta None known  
propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Landscape Uses:Specimen. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. The dormant plant is very cold-hardy, though the young growth in spring can be damaged by late frosts. It prefers growing in a continental climate, doing best in eastern and south-eastern England[200]. Most members of this genus transplant easily, even when fairly large[11]. Special Features:Attractive foliage, Not North American native, Blooms are very showy.

## 6.2.249 *Juniperus excelsa*

Grecian Juniper  
5 tlin 9 cyuc 2 kcaak 3 tcan 1 dwat 20 m hkuc  
htut cyutli hgatkyuctup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Juniperus excelsa* is an evergreen Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A liquid is obtained from the fruit[146] (used for drinking?). The cones are about 7 - 12mm in diameter and take 2 years to mature[200].

tcanta Fuel Incense Miscellany Roofing WoodThe bark is used for roofing[146]. Wood - moderately hard, close and even grained, fragrant, good quality. Used for construction, fuel and it is also burnt as an incense[1, 146, 158]. The crushed foliage emits a warm resinous scent[185].

dwatta MiscellanyThe smoke from the branches is used in India to treat the delirium of fevers[240].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in dry soils. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[11] and succeeding on chalk[200]. Plants are tender when young, they require a sheltered position[1]. The crushed foliage emits a warm resinous scent[185]. Plants are usually dioecious though sometimes they are monoecious[11]. Male and female plants must be grown if seed is required. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 6.2.250 *Ampelopsis brevipedunculata*

Porcelain Berry, Amur peppervine, Blueberry Climber, Porcelain Berry Vine  
5 tlin 8 cyuc 2 kcaak 1 tcan 2 dwat 20 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Ampelopsis brevipedunculata* is a deciduous Climber growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from July to August, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Leaf buds - cooked[105]. Leaves and stems - cooked[2, 105, 177]. Fruit - raw or cooked[105, 177]. The fruit is 6 - 8mm in diameter[200] and is carried in small bunches like grapes[K]. Not very palatable[K].

tcanta An ornamental plant. Landscape Uses: Arbor, Container, Pollard.

dwatta Antiphologistic Depurative FebrifugeThe fresh fruits, roots and leaves are antiphologistic, depurative and febrifuge. Resolves clots[147]. It is used externally in the treatment of boils, abscesses and ulcers, traumatic bruises and aches[147].

propta Seed - sow in pots in a cold frame in the autumn or stratify for 6 weeks at 5°C and sow in the spring[200]. Germination can be quite slow, sometimes taking more than a year. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. When they are more than 20cm tall, they can be planted out into their permanent positions, preferably in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long, July/August in a frame[78]. Cuttings or eyes in late autumn or winter. Either place them in the ground in a greenhouse or cold frame, or put them in pots. An eye cutting is where you have just one bud at the top and a short length of stem with a small part of the bark removed. These normally root well and grow away vigorously, being ready to plant into their permanent positions the following autumn. Layering into pots in late summer. Partially sever the stem in spring and then lift the new plants in the autumn[78].

nwatta Landscape Uses:Arbor, Container, Pollard. Prefers a deep rich loam in a warm sheltered position in full sun[11, 200]. Succeeds in poor soils[182]. Does well on a south wall[11, 219]. A very ornamental plant, there are some named varieties[182]. Most forms of this species, especially the sub-species *A. brevipedunculata maximowiczii*. (Reg.)Rehd. (syn *A. heterophylla*. Sieb. and Zucc.), are very hardy in Britain when dormant, but the cultivar 'Elegans' is frost-tender and usually grown as a pot plant[200]. The draft Flora of China has a different treatment for these plants, it recognises *A. heterophylla* as the correct name for *A. brevipedunculata maximowiczii* and reduces this species to a subspecies as *A. heterophylla brevipedunculata*[266]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants rarely fruit in Britain except after a long hot summer[200]. Another report

says that if the plant is growing in a poor soil on a south facing wall then it fruits quite regularly[182]. Plants fruit better if their roots are restricted, this can be achieved by root pruning in the winter or by putting the plant into a large container and then placing this in the soil[200]. Growth, especially in good soils, can be very vigorous and this is usually at the expense of the fruits[202]. Any pruning is best carried out in the winter[219]. The shoots have sticky pads and are self-supporting on walls[11]. Other reports say that plants climb by means of coiling tendrils but large plants often need tying in to support the weight of foliage[200, 219]. Special Features: Attracts birds, Attractive foliage, Not North American native, Invasive, Inconspicuous flowers or blooms.

### 6.2.251 Celtis caucasica

Caucasian hackberry

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc htut cyutli hgatkyuctup hwicli hyishrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Celtis caucasica is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw[3, 105]. A mealy pleasant taste[74]. The fruit is about 4 - 5mm in diameter, it has a thin, dry, sweet flesh with a pleasant flavour but a slight astringency[K]. The trees often produce large crops of fruit in Britain, but there is so little that is edible on each fruit that it is scarcely worthwhile[K].

tcanta Fuel WoodWood - very tough, elastic, durable, of high quality[74, 146]. An excellent fuel[146].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[74, 200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. Trees can be very long-lived, perhaps to 1000 years[200]. This species is closely allied to *C. australis* but it is much hardier and is more likely to thrive in Britain than most other species in this genus[11, 200]. A tree at Kew in September 1989 was 12 metres tall though it was not bearing fruit[K]. Coppices well[146]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.252 Quercus phellos

Willow Oak

5 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus phellos is a deciduous Tree growing to 20 m (65ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated

by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[2, 63, 105]. Rather small, it is only 1cm long[11, 200]. The seed can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Buttons Charcoal Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The bark contains about 10% tannin and is a commercial source of that material[223]. Tannin is also found in the leaves and wood[223]. The seedcups are used as buttons[95]. Wood - close-grained, strong, not hard, heavy, not durable[46, 61, 82, 171, 227]. It weighs 46lb per cubic foot[227]. Of rather low quality for an oak but it is sufficiently abundant to be harvested commercially. The wood is used for construction, fellies of wheels and charcoal[46, 61, 82, 171, 227].

dwatta Analgesic Astringent Dysentery SalveA decoction of the wood chips or bark has been applied externally as an analgesic and as a bath for aches, pains, sores, cuts and haemorrhoids[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Although it prefers warmer summers than are usually experienced in Britain[200], this species thrives in this country[11], though it rarely sets seed here[80]. Trees commence to bear seeds when about 20 years old in the wild and good crops are usually produced annually[229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. A very ornamental plant[1]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

### 6.2.253 Ulmus parvifolia

Chinese Elm, Lacebark Elm

5 tin 10 cyuc 2 kcaak 0 tcan 1 dwat 18 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ulmus parvifolia is a deciduous Tree growing to 18 m (59ft) by 18 m (59ft) at a medium rate. See above for

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Cardaria draba is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: CondimentYoung leaves and shoots - raw in salads or cooked as a potherb[2, 61, 105, 183]. A report says that the young leaves contain the toxin hydrogen cyanide, though does not give any more details[240]. In small quantities this substance is fairly harmless, and has even been recommended as having health benefits, but caution is suggested if you eat these leaves[K]. The pungent leaves are used as a seasoning[183]. The seed is used as a condiment, it is a pepper substitute[2, 17, 61, 74, 148, 183].

tcanta None known

dwatta Antiscorbatic CarminativeThe plant is antiscorbatic[240]. The seeds have been used as a cure for flatulence and fish poison[240]. It is assumed that this report is referring to food poisoning caused by eating suspect fish[K].

propta Seed - sow in situ in spring. There is very little need to encourage this plant, it is a rapidly spreading weed in Britain. Division in spring.

nwatta Succeeds in a sunny position in most soils.

### 6.2.378 Gastrodia elata

Tien Ma

5 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc pcmhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gastrodia elata is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - raw or roasted[61, 178]. Large[178].

tcanta None known

dwatta Analgesic Antispasmodic Aphrodisiac Carminative Cholagogue Epilepsy Sedative TonicThis species has been used in Chinese herbal medicine for over 1,500 years[238]. The root contains a number of phenolic compounds with medicinal actions[279]. It is a sweet, acrid, herb that is analgesic, anticonvulsive, antispasmodic, carminative, cholagogue, sedative and tonic[147, 174, 176, 238, 279]. It is used internally in the treatment of convulsive illnesses (such as epilepsy and tetanus), rheumatoid arthritis, vertigo and numbness associated with liver disharmony[238]. The root is harvested in the autumn and dried for later use[238]. The stem is aphrodisiac and tonic[218].

propta Seed - surface sow, preferably as soon as it is ripe, into the plants natural habitat near existing colonies, or onto a bed of Quercus wood inoculated with the fungus *Armillaria mellea* (introduce this fungus into your land with extreme caution since it kills trees and there is no known preventative[K]). The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant. Division in autumn. The plant is very intolerant of root disturbance, any moving or dividing should be attempted in the autumn, keep a large ball of soil around the plant[1].

nwatta A saprophytic herb, it is without green parts and is entirely dependant upon a fungus for its nutrition[238]. This makes it very difficult to cultivate outside its native range. As well as its fungal host, it also requires a damp humus-rich soil in a sheltered woodland position[238]. The plants are very hardy, tolerating tempera-

tures down to at least -15˚c[238]. This plant is becoming increasingly rare in the wild, due to over-collection as a medicinal plant[238]. Methods of cultivating it have now been devised in China[238]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230].

### 6.2.379 Lonicera venulosa

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lonicera venulosa is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: The following report is for the closely related *L. villosa*, it would be worthwhile experimenting with this plant to check on edibility[K]. Fruit - raw or preserved[43, 105, 200]. A milder flavour than most edible honeysuckles, they can be eaten raw but are mainly used in making jams, jellies and refreshing drinks[183].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200]. Closely related to *L. caerulea*[200].

### 6.2.380 Cirsium eriophorum

Wooly Thistle

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Cirsium eriophorum is a BIENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves Oil StemEdible Uses: OilYoung leaves - raw[4, 183]. Young stems - raw or cooked. An asparagus or rhubarb substitute[4, 12, 183]. The stems are peeled and soaked in water to remove the bitterness, they are then said to be excellent eating[4, 183]. Flower buds - cooked. A globe artichoke substitute[2, 177, 183] but much smaller and even more fiddly.

tcanta Oil TinnerThe seed fluff is used as a tinder[106]. The seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

dwatta None known

propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20˚c.

nwatta An easily grown plant, succeeding in any ordinary garden soil in a sunny position[200].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border, Container, Foundation, Seashore, Specimen, Woodland garden. Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. The flowers attract butterflies and moths[30]. The plant also attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238]. Special Features: Attractive foliage, North American native, Naturalizing, Suitable for cut flowers, Suitable for dried flowers.

### 6.2.375 *Dendranthema x grandiflorum*

Chrysanthemum, Cut Mum, Garden Mum, Pot Mum, Florist's Chrysanthemum

5 tlin 10 cyuc 2 kcaak 0 tcan 3 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwix hpa7tmwatli xre7t hjonli

drutta *Dendranthema x grandiflorum* is a PERENNIAL growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: TeaThe flower heads or petals[46, 116, 179] are parboiled and served as a salad with tofu and seasoned with vinegar or soya sauce[183]. They can also be prepared as tempura, pickled, dried or added to soups[183]. The petals contain about 1.9% protein, 0.9% fat, 5.3% carbohydrate, 0.7% ash[179]. Leaves - cooked[46, 105, 179]. Used as fritters, they are aromatic[183]. Some varieties have been selected for their low bitterness[116]. An aromatic tea is made from the leaves[183]. A tangy aromatic tea is made from the flowers or flower petals[179]. For a sweeter tea only the petals are used[183].

tcanta PollutionPlants have been grown indoors in pots in order to help remove toxins from the atmosphere. It is especially good at removing chemical vapours, especially formaldehyde, benzene and ammonia[259].

dwatta Antibacterial Antifungal Carminative Depurative Diaphoretic Febrifuge Ophthalmic Refrigerant SedativeChrysanthemum flowers, known in China as Ju Hua, are a bitter aromatic herb that has been used for thousands of years in Chinese medicine[238, 254]. The flower heads are drunk as a refreshing tisane and are used to improve vision, soothe sore eyes, relieve headaches, counter infections etc[254]. They are antibacterial, antifungal, anti-inflammatory, carminative, depurative, diaphoretic, febrifuge, ophthalmic, refrigerant and sedative[116, 147, 176, 218, 238]. Taken internally they dilate the coronary artery, thus increasing the flow of blood to the heart, and so are used in the treatment of hypertension, coronary heart diseases and angina[238]. The flowers are harvested when fully open in the autumn and are dried for later use[238]. In China they are steamed before being dried to make them less bitter[238]. The leaf juice is smeared onto wounds[218].

propta Seed - sow spring to early summer in a greenhouse and only just cover the seed. It usually germinates in 10 - 18 days at 15°C but if it does not germinate within 4 weeks then try chilling the seed for 3 weeks in the salad compartment of a fridge[164]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. This is a hybrid species and so will not breed true from seed. Division in spring. Larger

clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Specimen. Succeeds in most well-drained fertile soils in a sunny position[1, 200]. This species is not fully hardy in Britain, many of its cultivars requiring greenhouse protection in the colder areas of the country[1]. The chrysanthemum is widely cultivated as an ornamental flowering plant[200], there are many named varieties. It is also occasionally grown in the Orient for its edible leaves, a number of cultivars have been developed with leaves that are low in bitterness[116]. It has been proposed (1999) to restore this species to *Chrysanthemum* as *C. x morifolium* Ramat. since the plant is so widely known under this name. Special Features:Attractive foliage, Fragrant foliage, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers, Attractive flowers or blooms, Seldomly re-blooms.

### 6.2.376 *Ferula gummosa*

Galbanum

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprklwix hpa7tmwatli fyfxre7t hjonli

drutta *Ferula gummosa* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe gum resin obtained from the root is used as a celery-like food flavouring[177, 238].

tcanta The aromatic gum resin 'Galbanum' is obtained from wounds made in the stem[4]. It is collected by removing soil from around the top of the root and then cutting a slice off the root[64, 238] and can also be obtained from incisions made in the stem[238]. It is used medicinally and is also an ingredient of incense[1, 64, 171, 238]. It was an important ingredient of the incense used by the Israelites[268].

dwatta Antispasmodic Carminative Expectorant StimulantThe whole plant, but especially the root, contains the gum resin 'galbanum'[4]. This is antispasmodic, carminative, expectorant and stimulant[4, 46, 64, 238]. It is used internally in the treatment of chronic bronchitis, asthma and other chest complaints[4, 238]. It is a digestive stimulant and antispasmodic, reducing flatulence, griping pains and colic[254]. Externally it is used as a plaster for inflammatory swellings, ulcers, boils, wounds and skin complaints[4, 238].

propta Seed - best sown as soon as the seed is ripe in a greenhouse in autumn[1]. Otherwise sow in April in a greenhouse. Prick out the seedlings into individual pots as soon as they are large enough to handle. Plant them out into their permanent positions whilst still small because the plants dislike root disturbance[1]. Give the plants a protective mulch for at least their first winter outdoors. Division in autumn. This may be inadvisable due to the plants dislike of root disturbance.

nwatta Succeeds in most soils[1]. Requires a deep fertile soil in a sunny position[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. Another report says that it tolerates temperatures down to at least -15°C and should therefore succeed outdoors in most parts of the country[238]. Plants are intolerant of root disturbance due to their long taproot[200]. They should be planted into their final positions as soon as possible. The flowers have an unpleasant smell[245].

### 6.2.377 *Cardaria draba*

Hoary Cress, Whitetop

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc

USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from March to January, in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Fruit Inner bark LeavesEdible Uses: Leaves - raw or cooked[105, 177]. Immature fruits, used just after they are formed - raw or cooked[105, 132]. An aromatic, unusual flavour, leaving the mouth feeling fresh and the breath smelling pleasant[132]. It contains about 34.4% protein, 28.2% fat, 17% carbohydrate, 5% ash[132]. Inner bark - cooked. A mucilaginous texture[105, 177]. No more details are given but inner bark is often dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[K].

tcanta Shelterbelt WoodFairly resistant to maritime exposure, it can be grown in a shelter belt[K].

dwatta Antidote Demulcent Diuretic Expectorant Febrifuge Hypnotic LithotropicThe leaves are antidote and lithotropic[218]. The stem bark is demulcent, diuretic, expectorant, febrifuge, hypnotic and lithotropic[178, 218]. The flowers are used in the treatment of fevers and neuritis[218].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. One to two months stratification can improve germination rates. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Landscape Uses:Aggressive surface roots possible, Pollard, Specimen, Street tree. Easily grown in any soil of at least moderate quality so long as it is well drained[1]. Fairly tolerant of maritime exposure, it succeeds outdoors in a very exposed position at Rosewarne in N. Cornwall[K]. Resistant to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by a beetle. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species hybridize freely, the pollen stores well and can be kept for use with species that flower at different times[200]. Trees retain their leaves until early in the new year[11] and in areas with mild winters will often retain them until new leaves are formed in the spring[188]. A good companion for grapes[18]. There are some named forms, developed for their ornamental value. 'Frosty' and 'Geisha' are small bushes whilst 'Pumila' is a minute bush for the rock garden. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 6.2.254 *Celtis laevigata*

Sugarberry, Netleaf hackberry, Texan sugarberry, Sugar Hackberry

5 tlin 10 cyuc 2 kcaak 3 tcan 1 dwat 18 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprklwix hpa7tmwatli xre7t hjonli

drutta *Celtis laevigata* is a deciduous Tree growing to 18 m (59ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally

poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[61, 105, 257]. The flesh is thin, dry and sweetish, covering a single large seed[149, 183]. The fruit, which is orange to brown or red when fully ripe, is 5 - 8mm in diameter[235, 270].

tcanta Fuel Miscellany WoodWood - soft, not strong, close grained. It weighs 49lb per cubic foot and is used for cheap furniture, fencing, fuel[61, 82, 227].

dwatta Miscellany VDA decoction of the bark has been used in the treatment of sore throats[257]. It has also been used, mixed with powdered shells, as a treatment for VD[257].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Landscape Uses:Erosion control, Pest tolerant, Aggressive surface roots possible, Street tree, Woodland garden. Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Plants are usually found on clay soils in the wild[229]. Established plants are very drought resistant[200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. A very variable species, according to some botanists these merit varietal status whilst other botanists say that the differences are too slight[227]. Trees are moderate to fast-growing, probably living no more than 125 - 150 years[229]. They can be very long-lived according to another report, perhaps surviving for 1000 years[200]. Trees fruit heavily most years[229]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Naturalizing, Wetlands plant, Attracts butterflies, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone, 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 6.2.255 *Celtis jessoensis*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprklwix hpa7tmwatli xre7t hjonli

drutta *Celtis jessoensis* is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177]. We have no further information, but the fruit is liable to consist of a thin, sweet, though dry and mealy flesh around a large seed[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. Trees can be very long-lived, perhaps to 1000 years[200]. This species is closely related to *C. bungeana*[11]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.256 Carya texana

Black Hickory

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta Carya texana is a deciduous Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 177]. A sweet flavour, but the seed is small with a very thick shell[149, 227]. Another report says that the kernel has a bitter flavour[274]. The seed is up to 4cm long[229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel WoodWood - close grained, tough, strong, brittle[82, 149]. It weighs 50lb per cubic foot[235]. Used mainly for fuel, it burns well giving off a lot of heat[82, 149].

dwatta None known

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing[200]. There is some confusion over the naming of this species, with two separate authors of the name being cited. *C. texana*. Buckl. is used by some authorities as the correct name and *C. buckleyi* (q.v.) is given as a synonym of that species[11, 137].

However, other authorities cite *C. texana*. DC. as the correct name, in this case *C. buckleyi* remains as a separate species[82]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

### 6.2.257 Bumelia lanuginosa

Chittamwood

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwishsom hpa7tmwatli xre7t hjonli

drutta Bumelia lanuginosa is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Gum GumFruit - usually pickled[161, 177]. Not very tasty according to one report[61] whilst another says that large quantities can cause stomach upsets[149]. The fruit is between 1 - 2cm in diameter[200]. A clear viscid gum is obtained from the cut wood[82]. It also exudes freely from wounds on the trunk and branches[227]. The dried and ground up bark is used like chicla as a chewing gum[61, 177].

tcanta Gum Gum Shelterbelt WoodWood - heavy, rather soft, not strong, close grained[82, 149]. It weighs about 40lb per cubic foot[227]. Used for tool handles, cabinet making etc[82, 149].

dwatta None known

propta Seed - we have no details on this species but would suggest that if ripe seed can be obtained it should be sown straight away in a cold greenhouse. Stored seed can be sown in late winter or early spring in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in a warm sunny site in any freely draining moderately fertile soil[200]. Tolerates salt spray[82]. This species is probably hardy in the milder areas of the country[1, 11]. Another report says that plants are cut back by temperatures below about -15°c but that they can regenerate freely from the base[200]. The flowers are an excellent source of honey[274].

### 6.2.258 Fagus lucida

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc

pcimhmimhtut cyutli kyucctup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Fagus lucida is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to June, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils.

nwatta Requires a lime-free humus-rich moist soil in sun or light shade[182]. Prefers moderate shade, especially on the roots[1, 200], but it can also succeed in full sun[11]. Grows well in a woodland garden[200]. Dormant plants are hardy to about -20°c[200]. The young growth in spring is susceptible to damage by late frosts but the plants are otherwise of easy cultivation[182]. Flowers are produced on the previous years wood[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.372 Prunus glandulosa

Korean Cherry, Dwarf Flowering Almond

5 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc

htut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Prunus glandulosa is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - preserved or pickled[74, 177, 183]. The fruit is about 10mm in diameter and contains one large seed[200]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta DyeA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

dwatta Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Plants flower best when grown against a south or west-facing wall[188]. A very ornamental plant[1]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.2.373 Phalaris canariensis

Canary Grass, Annual canarygrass

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc

htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Phalaris canariensis is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from May to October, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked. Widely grown as a food for caged birds, the seed

is rather small but can also be used as a cereal for making porridge etc[2]. It can be ground into a flour and used for making cakes, puddings etc[2, 22, 46, 61, 74, 115]. Leaves - cooked[106]. The young plant is used[177].

tcanta None known

dwatta None known

propta Seed - sow spring in situ[162].

nwatta An easily grown plant, succeeding in an ordinary garden soil[1]. It is tolerant of most conditions, dry or wet[200]. Cultivated for its seed which is commonly used in wild bird food mixes[1].

### 6.2.374 Solidago canadensis

Canadian Goldenrod, Shorthair goldenrod, Harger's goldenrod, Rough Canada goldenrod, Common Goldenrod
5 tlin 10 cyuc 2 kcaak 0 tcan 2 dwat 1.8 m hkuc
hminhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyfxxre7t hjonli

drutta Solidago canadensis is a PERENNIAL growing to 1.8 m (6ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Oil TeaYoung leaves and flowering stems - cooked[172]. Seed[22, 46, 61, 105, 161, 183]. Used as a thickener in soups[172]. The seed is very small[K] and is only used as a survival food when all else fails[222]. A tea can be made from the flowers and/or the leaves[172, 183].

tcanta Dye OilMustard, orange and brown dyes can be obtained from the whole plant[168]. The source of 'Canadian goldenrod' oil[46]. We have no further details, but it is likely to be an essential oil.

dwatta Antiseptic Haemostatic Kidney Salve Styptic UrinaryHaemostatic, styptic[168, 172]. The root is applied as a poultice to burns[168, 172, 222]. An infusion of the dried powdered herb can be used as an antiseptic[168, 172]. The blossoms are analgesic, astringent and febrifuge[257]. They have been chewed and the juice slowly swallowed to treat sore throats[213, 222]. A tea made from the flowers is used in the treatment of diarrhoea, body pains, fevers and snakebites[222, 257]. The plant contains quercetin, a compound that is reportedly useful in the treatment of haemorrhagic nephritis[222]. This plant is said to have similar medicinal properties to *S. virgaurea*. These are: Goldenrod is a safe and gentle remedy for a number of disorders. In particular, it is a valuable astringent remedy treating wounds and bleeding, whilst it is particularly useful in the treatment of urinary tract disorders, being used both for serious ailments such as nephritis and for more common problems such as cystitis[254]. The plant contains saponins that are antifungal and act specifically against the *Candida* fungus which is the cause of vaginal and oral thrush[238, 254]. It also contains rutin which is used to treat capillary fragility, and phenolic glycosides which are anti-inflammatory[238]. The leaves and flowering tops are anthelmintic, anti-inflammatory, antiseptic, aromatic, astringent, carminative, diaphoretic, mildly diuretic, febrifuge and stimulant[4, 7, 9, 21, 147, 165]. A good vulnerary herb, it has also proved of value when used internally in the treatment of urinary infections, chronic catarrh, skin diseases, influenza, whooping cough, bladder and kidney stones etc[4, 238]. Due to its mild action, goldenrod is used to treat gastro-enteritis in children[254]. It makes an excellent mouthwash in the treatment of thrush[7]. The plant is gathered in the summer and dried for later use[7]. The seed is anticoagulant, astringent and carminative[1218]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of kidney and bladder disorders, rheumatism and arthritis[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Solidago canadensis* for infections of the urinary tract, and kidney and bladder stones (see [302] for critics of commission E).



propta Seed - sow March/April in a greenhouse and only just cover the seed. Germination usually takes place in 1 - 3 months at 15°c[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. When the plants are large enough to handle, plant them out into their permanent positions in late spring or early summer. Division in early spring or autumn[111].

nwatta Succeeds in ordinary garden soil, tolerating partial shade[200]. Requires a well-drained soil and a sheltered position[42]. Prefers a deep rich sandy loamy soil[1, 111]. Prefers a soil that is not too rich and a sunny position[200]. Grows well on hot dry banks and in thin grass[42, 200]. Established plants are drought tolerant[190]. Plants are hardy to about -15°c[187]. Plants seem to be immune to the predations of rabbits[233].

### 6.2.370 Lavandula x intermedia

Lavender, Lavandin

5 tlin 9 cyuc 2 kcaak 5 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli hcatkytucup hwicli hrasjlutnyik hpa7tli flatpriklwissilpwni hpa7tmwatli xre7t hjonli

drutta Lavandula x intermedia is an evergreen Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: Condiment TeaThe following uses are for *L. angustifolia*, they should also apply to this hybrid:- Leaves, petals and flowering tips - raw. Used as a condiment in salads, soups, stews etc[2, 15, 183]. They provide a very aromatic flavour[7] and are too strong to be used in any quantity[K]. The fresh or dried flowers are used as a tea[183]. The fresh flowers are also crystallized or added to jams, ice-creams, vinegars etc as a flavouring[238]. An essential oil from the flowers is used as a food flavouring[183].

tcanta Companion Essential Hedge Incent Pot-pourri RepellentThe following uses are for the closely related *L. angustifolia*, they should also apply to this hybrid:- The essential oil that is obtained from the flowers is exquisitely scented and has a very wide range of applications, both in the home and commercially. It is commonly used in soap making, in making high quality perfumes (it is also used in 'Eau de Cologne'), it is also used as a detergent and cleaning agent, a food flavouring etc[21, 46, 57, 171, 238] and as an insect repellent[201]. Yields of 0.8 - 1% of the oil are obtained[7]. When growing the plant for its essential oil content, it is best to harvest the flowering stems as soon as the flowers have faded[245]. The aromatic leaves and flowers are used in pot-pourri[238] and as an insect repellent in the linen cupboard etc[14, 18, 20]. They are also said to repel mice[20]. The flowering stems, once the flowers have been removed for use in pot-pourri etc, can be tied in small bundles and burnt as incense sticks[245]. Can be grown as a low hedge, responding well to trimming[29].

dwatta Antihalitosis Antiseptic Antispasmodic Aromatherapy Aromatic Carminative Chologogue Diuretic Nervine Sedative Stimulant Stomachic TonicThe following uses are for *L. angustifolia*, they should also apply to this hybrid:- Lavender is a commonly used household herbal remedy. An essential oil obtained from the flowers is antihalitosis, antiseptic, antispasmodic, aromatic, carminative, chologogue, diuretic, nervine, sedative, stimulant, stomachic and tonic[4, 7, 9, 21, 165, 238]. It is not often used internally, though it is a useful carminative and nervine[4]. It is mainly used externally where it is an excellent restorative and tonic - when rubbed into the temples, for example, it can cure a nervous headache, and it is a delightful addition to the bath-water[4]. Its antiseptic properties also make it useful in the treatment of burns, sunburn, scalds, bites, vaginal discharge, anal fissure etc, where it also soothes the affected part of the body and can prevent the formation of

permanent scar tissue[4, 238]. The essential oil is used in aromatherapy. Its keyword is 'Immune system'[210].

propta Seed - sow spring in a greenhouse and only just cover the seed[4]. It usually germinates in 1 - 3 months at 15°c. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in late spring after the last expected frosts. This species is a hybrid and will not come true from seed. Cuttings of half-ripe wood 7 - 10cm with a heel, July/August in a frame. Usually very east, a high percentage will root within a few weeks[78]. Grow them on in the greenhouse for their first winter and plant them out in late spring after the last expected frosts. Cuttings 7cm with a heel succeed at almost any time of the year[1]. Layering.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Massing, Rock garden, Seashore, Specimen. Succeeds in almost any soil so long as it is well-drained and not too acid[1, 200]. Prefers a sunny position in a neutral to alkaline soil[1, 4, 14]. Prefers a light warm dry soil[37]. When grown in rich soils the plants tend to produce more leaves but less essential oils[4]. Established plants are drought tolerant[190]. Very tolerant of salt wind exposure[K]. When growing for maximum essential oil content, the plant must be given a very warm sunny position and will do best in a light sandy soil, the fragrance being especially pronounced in a chalky soil[245]. Plants are hardy to between -10 and -15°c[184]. Lavender is a very ornamental plant that is often grown in the herb garden and is also grown commercially for its essential oil[1, 4]. This species is a very variable hybrid between the two main species of lavender, *L. angustifolia* and *L. latifolia*[200], There are several named varieties[200, 238]. Not a very long-lived plant, it can be trimmed to keep it tidy but is probably best replaced every 10 years[200]. Any trimming is best done in spring and should not be done in the autumn since this can encourage new growth that will not be very cold-hardy[200]. A good bee plant, also attracting butterflies and moths[7, 24, 30]. Lavender makes a good companion for most plants[54], growing especially well with cabbages[14]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above, Fragrant flowers, Attractive flowers or blooms.

### 6.2.371 Menziesia ferruginea

False Huckleberry, Rusty menziesia
5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Menziesia ferruginea is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit NectarEdible Uses: Fruit - fresh or dried[61, 105, 183]. The fruit is about 5 - 7mm in diameter[200]. The nectar has been sucked from the flowers to sweeten the mouth[257].

tcanta None known
dwatta Cardiac Poulitce StomachicThe leaves are cardiac[257]. They have been chewed to relieve heart pain and treat stomach problems[257]. A poultice of the heated leaves has been applied to sores and swellings[257].

propta Seed - best sown in a shady position in a cold frame in the autumn[200] but it can also be sown in late winter [78]. Surface sow and do not allow the compost to become dry. Germination is variable and can take 1 - 2 months at 15°c[78]. Keep the seedlings heavily shaded and prick them out into individual pots when they are 12 months old[78]. Plant them out into their permanent positions in the summer once they are more than 15cm tall. Cuttings of semi-ripe wood, 2 - 5cm with a heel, May/June in a frame. Keep them shaded. The cuttings are very slow to root but usually a good percentage will succeed[78]. Division in early spring just before active growth begins[78]. Layering.

It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Coffee OilYoung leaves - raw. A very nice mild flavour, but the leaves quickly become tough so only the youngest should be used. New growth is usually produced for 2 periods of 3 weeks each year, one in spring and one in mid-summer. Edible seed - raw or cooked[105, 177]. Rich in oil. The seed should not be eaten in large quantities. It can be dried and ground into a powder, then used with cereal flours in making bread, cakes etc. An edible semi-drying oil is obtained from the seed[105, 177]. The roasted seed is a coffee substitute.

tcanta OilNone known

dwatta None known

propta Seed - the seed has a short viability and is best sown as soon as it is ripe in the autumn in a cold frame. Protect the seed from mice. Germination takes place in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seedlings are slow growing for the first few years and are very susceptible to damage by late frosts. The seed can also be sown in an outdoor seedbed in the autumn. The seedlings can be left in the open ground for three years before transplanting, but do best if put into their final positions as soon as possible and given some protection from spring frosts.

nwatta Thrives on a light or medium soil[11], doing well on chalk[1], but ill-adapted for heavy wet soils[1]. Young trees are very shade tolerant, but are subject to frost damage so are best grown in a woodland position which will protect them[200]. Although very cold hardy, this species requires hotter summers than are normally experienced in Britain so is not usually a success here and is very slow growing[200]. Trees have surface-feeding roots and also cast a dense shade. This greatly inhibits the growth of other plants and, especially where a number of the trees are growing together, the ground beneath them is often almost devoid of vegetation.

### 6.2.259 Magnolia hypoleuca

Whitebark Magnolia
5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli xre7t hjonli

drutta Magnolia hypoleuca is a deciduous Tree growing to 15 m (49ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: CondimentThe young leaves and flower buds are boiled and eaten as a vegetable[183]. Older leaves are powdered and sprinkled on food as a flavouring[183]. Whole dried leaves are placed on a barbecue, filled with miso, leeks, daikon and shitake then broiled[183]. The delightful aroma of the leaves permeates the miso mixture which is then served with rice[183].

tcanta WoodWood - soft, fine grained, easily worked. Used for furniture, engraving, utensils etc[11, 46, 61, 178].

dwatta Anthelmintic Antiemetic Appetizer Deobstruent Emmenagogue Expectorant Ophthalmic Sedative Stomachic TonicAnthelmintic, antiemetic, appetizer, deobstruent, emmenagogue, expectorant, ophthalmic, sedative, stomachic, tonic[174, 178]. This plant is contra-indicated for pregnant women[174].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and

given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Dislikes alkaline soils[202]. Tolerates alkaline soils so long as they are deep and rich in humus[188]. The branches are brittle so a sheltered position is required[200]. Very tolerant of atmospheric pollution[200]. Hardy to about -20°c[200]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. A very ornamental plant[1]. The flowers are powerfully scented[245]. Cultivated for its medicinal bark in Japan[178]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.2.260 Morus cathayana

Hua Sang
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli hjonli

drutta Morus cathayana is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked[177]. The fruit is about 25mm in diameter[200]. Leaves - cooked[177]. A tea is made from the leaves[177].

tcanta None known

dwatta None known

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. Two trees at Kew in mid-July 1994 had reasonable crops of fairly long thin fruits with a pleasant flavour[K]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.261 Sinofranchetia chinensis

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwiss hpa7tmwatli nyanhjen hjonli

drutta Sinofranchetia chinensis is a deciduous Climber growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177]. Inspid[109]. The size of a grape[182]. The fruit is about 2cm in diameter[200].

tcanta None known

dwatta None known

propta Seed - can be sown as soon as it is ripe or in late winter in a cold frame. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Layering of new shoots in summer.

nwatta Succeeds in any ordinary garden soil in sun or shade[1, 200]. Prefers semi-shade[188, 219]. The young growth in spring can be damaged by late frosts. A fast-growing climbing plant[200], supporting itself by twining around other plants etc[219]. Any pruning is best carried out after the plant has finished flowering[219]. Dioecious, but female plants can produce fruits in the absence of male plants[11, 200]. The report does not say if this fruit contains viable seed, so it is best to assume that male and female plants must be grown if seed is required[K].

### 6.2.262 Pyrus calleryana

Callery Pear

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli hgattcup hwicli hraşljutnyikfripr hpa7tli frusflatprikrlwis hpa7tmwatli xre7t hjonli

drutta Pyrus calleryana is a deciduous Tree growing to 15 m (49ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from April to November, in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. Best used after it has been exposed to frost[177, 183], since this will soften and sweeten the flesh[K]. The fruit is about 25mm in diameter[200].

tcanta Rootstock WoodThis species is widely used as a rootstock[183], especially for cultivars of Pyrus pyrifolia[266]. It is said to induce earlier bearing[160]. The wood of this species is hard and close-grained, and is sometimes used for making furniture and stools[266].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Landscape Uses:Espalier, Firewood, Screen, Specimen, Street tree. Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Grows well on acid soils[160]. Plants are hardy to about -40°c when they are fully dormant[160]. There are many named forms selected for their ornamental value[200]. The cultivar 'Bradford' is resistant to fireblight[188]. Resists fireblight, collar rot, root aphid, pear psylla and root lesion nematodes[160]. Trees have a short dormancy period and lose their leaves late in the season[160]. Special Features: Not North American native, Naturalizing, Blooms are very showy.

### 6.2.263 Arbutus arizonica

Arizona Maderone

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 15 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasljut hpa7tli flat hpa7tmwatli fyfjxre7t hjonli

drutta Arbutus arizonica is an evergreen Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. The fruit is about 8mm in diameter with a thin sweetish flesh[82]. tcanta Charcoal WoodWood - heavy, soft, close-grained, brittle[82]. It produces a fine grade of charcoal[229].

dwatta AstringentThe bitter principles in the bark and leaves can be used as an astringent[229].

propta Seed - best surface sown in a cold frame as soon as it is ripe. Stored seed should be soaked for 5 - 6 days in warm water and then surface sown in a shady position in a greenhouse[78]. Do not allow the compost to become dry. 6 weeks cold stratification helps[134]. The seed usually germinates well in 2 - 3 months at 20°c[134]. Seedlings are prone to damp off[184], they are best transplanted to individual pots as soon as they are large enough to handle and should be kept well ventilated. Grow them on in a greenhouse for their first winter and then plant out in late spring after the last expected frosts[K]. Basal cuttings in late winter[200]. Cuttings of mature wood of the current season's growth, November/December in a frame. Poor percentage[78]. Layering of young wood - can take 2 years[1, 200].

nwatta Requires a lime-free nutrient-rich well-drained moisture-retentive soil in sun or semi-shade and shelter from cold drying winds, especially when young[200]. Succeeds in dry soils[82]. Plants are hardy to about -15°c[166, 200]. A slow-growing tree[229].

### 6.2.264 Cornus controversa

Giant Dogwood, Wedding Cake Tree,

5 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hraşljutnyikfripr hpa7tli flatprikrlwissliip hpa7tmwatli xre7t hjonli

drutta Cornus controversa is a deciduous Tree growing to 15 m (49ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit. OilEdible Uses: OilFruit[105, 177]. No more details are given. The fruit is about 6mm in diameter[200].

tcanta OilThe fruit provides an oil used in the lubricating and soap industry[266].

dwatta AntiphlogisticThe leaves are used in folk remedies to relieve pain and reduce swelling[266].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible,

kcakta Edible Parts: Flowers Leaves Oil Oil StemEdible Uses: Colouring Oil OilFlower buds - cooked. A globe arctihoke substitute[2, 4, 9, 115, 183], though they are much smaller and very fiddly to use[K]. Stems - cooked. Used as a vegetable, they are a cardoon (Cynara cardunculus) substitute[2, 4]. The stems are cooked in water like asparagus or rhubarb[12]. They are best if the rind is removed[4, 115, 183]. Leaves and young plants - cooked[9, 105]. They are harvested before the flowers develop and the prickles must be removed prior to cooking[9]. The petals are an adulterant for saffron[46, 61, 105, 183], used as a yellow food colouring and flavouring. A good quality edible oil is obtained from the seed[2, 4, 183]. The seed contains about 25% oil[4].

tcanta Oil Oil StuffingThe stem hairs are sometimes collected and used to stuff pillows[4]. An oil obtained from the seed is used as a fuel for lamps[4].

dwatta Astringent Cancer CardiotoxicThe flowering plant is cardiotoxic[9]. It is used in some proprietary heart medicines[9]. The juice of the plant has been used with good effect in the treatment of cancers and ulcers[4]. A decoction of the root is astringent[4]. It is used to diminish discharges from mucous membranes[4].

propta Seed - sow spring in situ[200]. The seed can also be sown in situ in autumn[200]. If the seed is in short supply then it can be sown in a pot in the greenhouse in the spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in early summer.

nwatta An easily grown plant, it succeeds in almost any ordinary garden soil[1, 111]. Requires a well-drained soil, preferably in full sun though it tolerates light shade[200]. Prefers a slightly alkaline soil[200]. Grows very well in poor soils, succeeding in hot dry situations and tolerating drought when it is established[190]. A slow-growing plant[188]. Hardy to about -15°c[200]. A very ornamental plant[1], the flowers are very attractive to bees[200]. Plants are prone to slug and snail damage[188]. Often self-sows, sometimes to the point of nuisance, though the seedlings can easily be hoed out and can also be transplanted if they are moved whilst still small[200].

### 6.2.367 Gaylussacia ursina

Bear Huckleberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hraşljutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaylussacia ursina is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 61, 183, 257]. Inspid[11].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 1 month warm stratification followed by 2 months cold[113]. When large enough to handle, prick the seedlings out into individual pots of lime-free compost and grow them on in light shade in a greenhouse or cold frame for at least their first winter. Plant out into their permanent positions in late spring or early summer when they are at least 15cm tall. Cuttings of half-ripe wood, July/August in a frame[200]. Layering. Division in spring.

nwatta Requires a lime-free moist peaty soil, thriving in sun or part shade[11, 182].

### 6.2.368 Phytolacca esculenta

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hraşljutnyik hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta Phytolacca esculenta is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The

species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - they must be cooked and are used as a spinach[1, 58, 105, 174, 183]. Only the young leaves should be used since they become toxic with age. Root - cooked[105, 183].

tcanta InkA red ink is obtained from the fruit[57].

dwatta Abortifacient Antiasthmatic Antibacterial Antifungal Antinflammatory Antiphlogistic Antitussive Diuretic Expectorant Hypotensive PurgativeThe roots contain saponins[279]. They are abortifacient, antiasthmatic, antibacterial, antifungal, antiinflammatory, antiphlogistic, antitussive, diuretic, expectorant, hypotensive and purgative[147, 174, 176, 279]. A decoction is used in the treatment of oedema, beri-beri, lumbago, rheumatism, abdominal distension and numbness of the throat[147, 176, 279]. Use with caution, see the notes above on toxicity[176].

propta Seed - sow autumn or spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it might be worthwhile trying an outdoor sowing in a seed bed in early spring. Grow the plants on in the seedbed for their first year and plant them out the following spring. Division in March or October. Use a sharp spade or knife to divide the rootstock, making sure that each section has at least one growth bud. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta An easily grown plant, succeeding in most soils[1], though preferring a moisture retentive soil in full sun or partial shade[200]. We have found the plants to be very tolerant of drought[K]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. The young growth in spring can be damaged by late frosts. There is sme disagreement over the correct name for this species with some authorities saying that it is no more than a synonym for *P. acinosa*[266], whilst others give it specific status[200]. There are reports that there is a white flowered plant, which could either be this species or a form of *P. acinosa* which is said to be non-toxic and to have an edible root[K]. See *P. acinosa* for more details. Plants seem to be immune to the predations of rabbits[233].

### 6.2.369 Asphodelus albus

Asphodel, Gamón-blanco

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hyishrasljut hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta Asphodelus albus is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: RootEdible Uses: The root was at one time eaten as a food bud, since it contains the alkaloid asphodeline, this is not really very advisable[7].

tcanta AlcoholAn alcohol can be obtained from the fermented roots[7].

dwatta Antidermatotic Detergent Emollient Vulnerary-The tubers are antidermatotic, detergent, emollient and vulnerary[7]. They are mainly used externally in the treatment of skin conditions and for lightening freckles[7]. They have also been employed internally as a cough remedy[7]. The tubers are harvested in the spring and dried for later use[7]. Use internally with caution, especially if you are suffering from nephritis or gastritis[7].

dwatta Antiasthmatic Antispasmodic Antitussive Antiviral Diaphoretic Diuretic Febrifuge Miscellany Nervine Tonic VasoconstrictorMembers of this genus contain various medicinally active alkaloids (but notably ephedrine) and they are widely used in preparations for the treatment of asthma and catarrh[238]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. The plant also has antiviral effects, particularly against influenza[238]. The stems are a pungent, bitter, warm herb that dilates the bronchial vessels whilst stimulating the heart and central nervous system[238]. The stems are also antitussive, diuretic, diaphoretic, febrifuge, hypertensive, nerve, tonic and vasoconstrictor[4, 21, 174, 238]. They are used internally in the treatment of asthma, hay fever and allergic complaints[238]. They are also combined with a number of other herbs and used in treating a wide range of complaints[238]. This herb should be used with great caution, preferably under the supervision of a qualified practitioner[238]. It should not be prescribed to patients who are taking monoamine oxidase inhibitors, or suffering from high blood pressure, hyperthyroidism or glaucoma[238]. Ephedrine is seen as a performance-boosting herb and, as such, is a forbidden substance in many sporting events such as athletics[K]. The stems can be harvested at any time of the year and are dried for later use[238].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and are also lime tolerant[200]. Plants are hardy to at least -15°c[200]. This species does not flower or fruit well in Britain[11]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.364 Gaultheria x wisleyensis

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc pcmimhm cyutli tcup hwicli hrasjlt hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaultheria x wisleyensis is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[11]. Not much flavour but reasonably palatable[K].

tcanta A good ground cover for shady situations[197], the plants spread by suckers and form dense thickets[208].

dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°c, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. This is a hybrid species and will not breed true. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring when new growth is about 7cm tall. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow

them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a cool moist but not boggy humus rich soil in shade or semi-shade[11, 200]. A peat and moisture loving species, it requires a lime-free soil[11]. This species has not as yet got a valid name, having recently been moved from the genus *Gaulnettya*[200]. Plants are hardy to about -20°c[184]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.365 Berberis fendleri

Colorado Barberry

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjltutnyikfrip hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis fendleri is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 161, 177, 257]. The fruits are about 5mm long[200].

tcanta DyeA yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil but is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they resprout well from the base[200].

### 6.2.366 Onopordum acanthium

Scotch Thistle, Scotch cottonthistle

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjltutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Onopordum acanthium is a BIENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Pest tolerant, Woodland garden.

An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188]. A very ornamental plant[1, 11], it is hardy to about -20°c[184]. This species is unusual in having alternate leaves whilst almost all other members of this genus have opposite leaves[182]. Closely related to *C. alternifolia*[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Attractive flowers or blooms.

### 6.2.265 Picea breweriana

Weeping Spruce, Brewer spruce

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc

htut cyutli tcup hwicli hyishrasjltutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Picea breweriana is an evergreen Tree growing to 15 m (49ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Inner bark SeedEdible Uses: TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are up to 10cm long[82]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food when all else fails. Seed - raw. The seed is about 2 - 4mm long[229] and is too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta WoodWood - soft, heavy, close grained[82]. It is valued for its use in the pulp industry to make paper[171].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Closely related to and often confused with *P. smithiana*. Very slow growing when young, plants are often no more than 1 metre tall when 10 years old. Growth increases somewhat with age and can average 30cm a year in older trees[185]. Increase in the

girth of trees grown in the open can be quite fast, averaging 3cm a year[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. The crushed shoots have a resinous aroma[245].

### 6.2.266 Rhamnus carolinianus

Indian Cherry, Oak, Carolina Buckthorn

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjltutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Rhamnus carolinianus is a deciduous Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit has a thin rather dry flesh[82] with a sweet and agreeable flavour[2, 11, 105, 229]. The fruit is about 7 - 10mm in diameter and contains 2 - 4 small seeds[229]. Some caution is advised, see the notes above on toxicity.

tcanta WoodWood - rather hard, light, close grained, not strong[82]. It weighs 34lb per cubic foot[227]. Too small to be of commercial value[229].

dwatta HepaticA tea made from the bark is emetic and strongly laxative[222]. It is used in the treatment of constipation with nervous or muscular atony of the intestines[222]. An infusion of the wood has been used in the treatment of jaundice[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed will require 1 - 2 months stratification at 5°c and should be sown as early in the year as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta Landscape Uses:Border, Erosion control, Pest tolerant, Standard, Specimen. Succeeds in any reasonably good soil[11], whether moderately acid or alkaline[149]. Prefers a moist moderately fertile soil in sun or partial shade[200]. One report suggests that the plant might not be very hardy in Britain[11], whilst another says that it is in climatic zone 6 and thus tolerates temperatures down to about -15°c[200]. A slow-growing and usually short-lived plant in the wild[229]. Plants are susceptible to ‘crown rust’ of oats[149]. The species in this genus are notably resistant to honey fungus[200]. This species is closely related to *R. purshiana*[11]. Special Features: North American native, Inconspicuous flowers or blooms.

### 6.2.267 Celtis reticulata

Paloblanco, Netleaf hackberry

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 12 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjltut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Celtis reticulata is a deciduous Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 61, 105, 161, 257]. Sweet and fleshy. The fruit can also be made into a jelly or used as a seasoning for savoury foods[183]. It can be dried and stored for winter

use[257]. The fruit is about 10mm in diameter[200], it has a thin flesh with a single large seed[K].

tcanta WoodA brown or red dye can be obtained from the leaves and branches[257]. Wood - heavy but soft and weak, it is not commercially important[229]. It can be used as a firewood[257].

dwatta StomachicThe plant has been used in the treatment of indigestion[257].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[200]. A moderate to slow-growing tree in the wild[229]. It prefers hotter summers and more sunlight than are normally experienced in Britain, so it often does not fully ripen its wood when growing in this country and is then very subject to die-back in winter[1, 11, 200]. Trees can be very long-lived, perhaps to 1000 years[200]. Considered by some botanists to be no more than a subspecies of *C. laevigata*[149]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.268 Berchemia racemosa

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Berchemia racemosa is a deciduous Climber growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit[177]. The ripe fruit is eaten[183]. The fruit is about 8mm in diameter[200]. Leaves - cooked and used as a vegetable[105, 177, 183]. The leaves are a tea substitute[177, 183].

tcanta None known dwatta None known

propta Seed - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[200]. Cuttings of mature wood of the current season's growth, November to January in a frame. Root cuttings in winter[200]. Layering of young stems in winter[200].

nwatta Requires a good moist well-drained loam, succeeding in full sun if the soil does not dry out otherwise it is best in light shade[11, 200]. Plants are hardy to about -15°c[200]. Plants climb by means of twining around supports[182]. They are useful for covering walls, fences and tree stumps[188]. The fruit takes about one year to ripen[275]. It is only produced in Britain after a hot summer[182, 219]. Plants do not normally require pruning[219].

### 6.2.269 Koelreuteria paniculata

Golden Rain Tree, Varnish Tree

5 tlin 8 cyuc 2 kcak 0 tcan 1 dwat 10 m hkuc htut cyutli kyuctcup hwicli hyishrasjlnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Koelreuteria paniculata is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Leaves SeedEdible Uses: Berries - roasted[2, 177]. Leaves and young shoots - cooked[2, 105, 177, 179].

tcanta Beads DyeA yellow dye is obtained from the flowers.[46, 61, 178]. A black dye is obtained from the leaves[178]. The seeds are used as beads in necklaces etc[46, 61, 178].

dwatta OphthalmicThe flowers are ophthalmic[178, 218]. They are used in the treatment of conjunctivitis and epiphora[218].

propta The seed requires a period of cold stratification. It is probably best sown as soon as it is ripe in a cold frame[200]. Pre-soak stored seed for 24 hours in warm water. If it swells up then sow it in a cold frame. If it does not swell then soak it for a further 24 hours in hot water prior to sowing. This should cause the seed to swell but, should this fail, scarification (taking care not to damage the seed embryo) followed by a further 24 hours in warm water should do the trick[80]. Germination is usually good[78], though the seedlings are very variable[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Consider giving the plants some protection from the cold for their first winter outdoors[78]. Root cuttings, 4cm taken in December. Plant horizontally in individual pots in a warm greenhouse[78].

nwatta Landscape Uses:Pest tolerant, Specimen. Succeeds in any good loamy soil[1, 11] and in dry soils. Prefers a sunny sheltered position[1, 11]. A wind resistant plant, but it does not like salt-laden winds[200]. Tolerates atmospheric pollution[200]. This species is hardy to about -10°c when fully dormant[200], though the young growth in spring can be damaged by late frosts. Grows best in areas with long hot summers, it is fast growing in such conditions[200]. A short-lived tree[11]. A good bee plant[108]. Plants are susceptible to coral spot fungus, especially if the wood is not properly ripened due to insufficient summer heat[11]. This species is notably resistant to honey fungus[200]. Special Features: Not North American native, Blooms are very showy.

### 6.2.270 Pyrus amygdaliformis

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Pyrus amygdaliformis is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is up to 3cm in diameter[200].

tcanta None known dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their

mid spring in a cold frame. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in summer[K] Division in spring or summer[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to put up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Staple Crop: Balanced carb Wild-collected as FoodAn easily grown plant, it succeeds in most soils, preferring a sandy soil[1] and a sunny position[162]. Established plants are very drought tolerant[190]. A very invasive plant, spreading by means of its wide-ranging roots[1, 187]. Cultivated in Japan for making mats etc[46, 61]. The Viking settlers of Iceland cultivated this plant until the beginning of the 20th century for its edible seed[183].

### 6.2.362 Lavandula angustifolia

English Lavender, True Lavender

5 tlin 8 cyuc 2 kcak 5 tcan 3 dwat 1.2 m hkuc htut cyutli hgatkyuctup hwicli hrasjlnyik hpa7tli flatpriklwissliphsom hpa7tmwatli xre7t hjonli

drutta Lavandula angustifolia is an evergreen Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: Condiment TeaLeaves, petals and flowering tips - raw. Used as a condiment in salads, soups, stews etc[2, 15, 183]. They provide a very aromatic flavour[7] and are too strong to be used in any quantity[K]. The fresh or dried flowers are used as a tea[183]. The fresh flowers are also crystallized or added to jams, ice-creams, vinegars etc as a flavouring[238]. An essential oil from the flowers is used as a food flavouring[183].

tcanta Companion Essential Hedge Incense Pot-pourri RepellentThe essential oil that is obtained from the flowers is exquisitely scented and has a very wide range of applications, both in the home and commercially. It is commonly used in soap making, in making high quality perfumes (it is also used in 'Eau de Cologne'), it is also used as a detergent and cleaning agent, a food flavouring etc[21, 46, 57, 171, 238] and as an insect repellent[201]. When growing the plant for its essential oil content, it is best to harvest the flowering stems as soon as the flowers have faded[245]. Yields of 0.8 - 1% of the oil are obtained[7]. The aromatic leaves and flowers are used in pot-pourri[238] and as an insect repellent in the linen cupboard etc[14, 18, 20]. They have been used in the past as a strewing herb in order to impart a sweet smell to rooms and to deter insects[244]. The leaves are also added to bath water for their fragrance and therapeutic properties[244]. They are also said to repel mice[20]. The flowering stems, once the flowers have been removed for use in pot-pourri etc, can be tied in small bundles and burnt as incense sticks[245]. Lavender can be grown as a low hedge, responding well to trimming[29]. There are several varieties, such as 'Hidcote Variety', 'Loddon Pink' and 'Folgate Blue' that are suitable for using as dwarf hedges 30 - 50cm tall[245].

dwatta Antianxiety Antihalitosis Antiseptic Antispasmodic Appetizer Aromatherapy Aromatic Carminative Cholagogue Diuretic Nervine Sedative Stimulant Stomachic TonicLavender is a commonly used household herb, though it is better known for its sweet-scented aroma than for its medicinal qualities[254]. However, it is an important relaxing herb, having a soothing and relaxing affect upon the nervous system[254]. The flowering spikes can be dried and used internally in a tincture, though the extracted essential oil is more commonly used. The essential oil is much more gentle in its action than most other essential oils and can be safely applied direct to the skin as an antiseptic to help heal wounds, burns etc[254]. An essential oil obtained from the flowers is antihalitosis, powerfully antiseptic, antispasmodic, aromatic,

carminative, cholagogue, diuretic, nervine, sedative, stimulant, stomachic and tonic[4, 7, 9, 21, 165, 238]. It is not often used internally, though it is a useful carminative and nervine[4]. It is mainly used externally where it is an excellent restorative and tonic - when rubbed into the temples, for example, it can cure a nervous headache, and it is a delightful addition to the bath-water[4]. Its powerful antiseptic properties are able to kill many of the common bacteria such as typhoid, diphtheria, streptococcus and Pneumococcus, as well as being a powerful antitode to some snake venoms[244]. It is very useful in the treatment of burns, sunburn, scalds, bites, vaginal discharge, anal fissure etc, where it also soothes the affected part of the body and can prevent the formation of permanent scar tissue[4, 238]. The essential oil is used in aromatherapy. Its keyword is 'Immune system'[210]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Lavandula angustifolia* for loss of appetite, nervousness and insomnia, circulatory disorders, dyspeptic complaints (see [302] for critics of commission E).

propta Seed - sow spring in a greenhouse and only just cover the seed[4]. It usually germinates in 1 - 3 months at 15°c. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings of half-ripe wood 7 - 10cm with a heel, July/August in a frame. Usually very east, a high percentage will root within a few weeks[78]. Grow them on in the greenhouse for their first winter and plant them out in late spring after the last expected frosts. Cuttings 7cm with a heel succeed at almost any time of the year[1]. Layering.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Massing, Rock garden, Seashore, Specimen. Succeeds in almost any soil so long as it is well-drained and not too acid[1, 200]. Prefers a sunny position in a neutral to alkaline soil[1, 4, 14]. Prefers a light warm dry soil[37]. When grown in rich soils the plants tend to produce more leaves but less essential oils[4]. Established plants are drought tolerant[190]. Plants are very tolerant of salt wind exposure[K]. When growing for maximum essential oil content, the plant must be given a very warm sunny position and will do best in a light sandy soil, the fragrance being especially pronounced in a chalky soil[245]. Plants are hardy to between -10 and -15°c[184]. Lavender is a very ornamental plant that is often grown in the herb garden and is also grown commercially for its essential oil[1, 4]. There are several named varieties[182, 183]. Not a very long-lived plant, it can be trimmed to keep it tidy but is probably best replaced every 10 years[200]. Any trimming is best done in spring and should not be done in the autumn since this can encourage new growth that will not be very cold-hardy[200]. A good bee plant, also attracting butterflies and moths[7, 24, 30]. Lavender makes a good companion for most plants[54], growing especially well with cabbages[14]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers, Attractive flowers or blooms.

### 6.2.363 Ephedra distachya

Sea Grape, Jointfir

5 tlin 9 cyuc 2 kcak 0 tcan 4 dwat 1 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Ephedra distachya is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[2, 105, 177]. A sweet but rather insipid flavour[K]. The fruit is about 6mm in diameter[200].

tcanta MiscellanyPlants can be used for ground cover, spaced about 60cm apart each way[208].

possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

**nwatta Landscape Uses:**Border, Ground cover, Specimen. A very easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but plants also succeed in partial shade. Often cultivated as a pot herb[50]. There are some named varieties[200]. The flowers have a sickly sweet smell[50]. A very invasive plant, spreading freely at the roots[200]. Unless you have the space to let it roam, it needs to be restrained by some means such as planting it in a container that is buried in the soil[K]. It is said to be a good companion for cabbages and tomatoes, its aromatic leaves repelling insect pests, though its aggressive root system also needs to be taken into account here. The whole plant has a mint-like aroma. The flowers are very attractive to bees and butterflies. Members of this genus are rarely if ever troubled by browsing deer[233]. Hybridizes freely with other members of this genus. **Special Features:** Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Suitable for dried flowers. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 6.2.360 *Mentha longifolia*

Horsemint

5 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Mentha longifolia* is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**ckakta Edible Parts:** LeavesEdible Uses: Condition TeaLeaves - raw or cooked. Peppermint-scented, they are used as a flavouring in salads, chutneys and cooked foods[183, 238]. A herb tea is made from the leaves[183]. An essential oil obtained from the leaves and flowering tops is used as a food flavouring in sweets etc[183]. A peppermint-like taste[183].

**tcanta Essential Repellent Strewing**The leaves contain about 0.57% essential oil[240]. It is sometimes used as a substitute for peppermint oil in confectionery[238]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

**dwatta Antiasthmatic Antiseptic Antispasmodic Carminative Stimulant**Horsemint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. The leaves and flowering stems are

antiasthmatic, antispasmodic, carminative and stimulant[4, 148, 240]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

**propta Seed** - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

**nwatta** An easily grown plant, it succeeds in most soils and situations so long as the soil is not too dry[1, 200]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but the plants also succeed in partial shade. There is some confusion over the name of this plant, it appears in the British flora[17] but according to Flora Europaea it is not found in Britain[50]. Sometimes cultivated for its leaves, there are some named varieties[183]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The whole plant has a mint-like aroma. The flowers are very attractive to bees and butterflies. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.361 *Leymus arenarius*

Lyme Grass, Sand ryegrass

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Leymus arenarius* is a PERENNIAL growing to 1.2 m (4ft 3in) by 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**ckakta Edible Parts:** SeedEdible Uses: Seed - cooked[2, 105]. It can be ground into a flour and used to make bread[13]. A delicious taste[183] but very fiddly to use, the seed is small and hard to extract[K]. When cooked like rice, it can be used as a sweet or savoury dish. Mixed 50/50 with wheat flour it adds a richness to biscuits etc[183]. The protein content of this grain is said to rival that of red beans or salmon[183]. (This report seems somewhat surprising, protein levels are not usually anywhere near that high in a cereal[K].)

**tcanta Fibre Soil stabilization Weaving**The leaves are used for making mats, rope, paper etc[46, 61]. The plants have a very extensive root system and so they are often planted near the coast in order to stabilize sand dunes[190, 200]. They can also be used as a ground cover for sandy open spaces but can be invasive[200, 208].

**dwatta None known**

**propta Seed** - sow mid spring in situ and only just cover the seed[162]. Germination should take place within 2 weeks. If the supply of seed is limited, it can also be sown in

first year. Plant them out in late spring or early summer of the following year.

**nwatta** Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200].

## 6.2.271 *Pyrus nivalis*

Snow Pear

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hrasjltunykfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Pyrus nivalis* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

**ckakta Edible Parts:** FruitEdible Uses: Fruit - raw or cooked[177]. A sour flavour, it is usually cooked or brewed into cider or perry[183, 200]. The fruit matures late in the season and is 3 - 5cm long[200].

**tcanta None known**

**dwatta None known**

**propta Seed** - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

**nwatta** Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. A very ornamental plant[1].

## 6.2.272 *Vitis acerifolia*

Bush Grape, Mapleleaf grape

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Vitis acerifolia* is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**ckakta Edible Parts:** Fruit LeavesEdible Uses: Fruit - raw or dried for winter use. A sweet flavour[177]. The fruit is about 16mm in diameter[200]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

**tcanta DyeA** yellow dye is obtained from the fresh or dried leaves[168].

**dwatta None known**

**propta Seed** - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large

enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

**nwatta** Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant, otherwise they bleed profusely[182, 200]. This species is closely related to *V. rupestris*[43]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.273 *Sorbus austriaca*

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Sorbus austriaca* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**ckakta Edible Parts:** FruitEdible Uses: Fruit - raw or cooked in preserves etc[K]. Rather mealy but a pleasant semi-sweet flavour when fully ripe[K]. The fruits are about 13mm across[200] and are borne in fairly large bunches making harvesting easy[K].

**tcanta None known**

**dwatta None known**

**propta Seed** - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

**nwatta** Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. This species is closely related to *S. intermedia*[200]. Plants are susceptible to fire-blight[188]. Trees seen at Wisley and at Cambridge Botanical Gardens in September 1993 were bearing very good crops of fruit[K]. The name of this species might have been mis-spelt, it could be *S. austriaca*[200].

## 6.2.274 *Malus prattii*

Pratt apple

5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Malus prattii* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline)

soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. Gritty[1]. The fruit is 10 - 15mm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. Plants fruit regularly at Kew[11]. The fruit is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.275 *Carya buckleyi*

Black hickory

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 10 m hkuc  
htut cyutli tcup hwicli hras|lutnyik hpa7tli flatprik|wis hpa7tmwatli fyif hjonli

drutta *Carya buckleyi* is a deciduous Tree growing to 10 m (32ft 10in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105]. A sweet flavour[1, 82]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel WoodWood - hard and brittle. Used mainly for fuel[82].

dwatta None known

propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78]. Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. Slow growing, especially when young[11]. Succeeds outdoors at Kew[11]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are

notably resistant to honey fungus[200]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. There is some confusion over the correct name of this species, some authorities place it under *C. texana*. Buckl.[137] whilst others say that *C. buckleyi* is the correct name and that there is also a distinct species *C. texana*. DC[11, 82]. According to the Flora of N. America, *C. buckleyi* Dewey. Is a synonym for *C. brunnescens* subsp. *Sphaerostachya*, whilst *C. buckleyi* Durand. Is a synonym for *C. texana*[270]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

### 6.2.276 *Vitis romanetii*

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 10 m hkuc  
htut cyutli kyuctcup hwicli hras|lutnyik hpa7tli flatprik|wis hpa7tmwatli xre7t hjonli

drutta *Vitis romanetii* is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[105, 177]. The fruit is about 8 - 12mm in diameter[200] and is borne in small bunches. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Requires a position in full sun[200]. This species is not hardy in the colder areas of the country[219]. Young growths and thin wood can be cut back by frosts[219]. Plants climb by means of tendrils[182]. Closely related to *V. davidii*[219]. Plants are rather tender in Britain when they are young, though older plants are hardy in most parts of the country[11]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.277 *Vitis baileyana*

Graybark Grape

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 10 m hkuc  
hmmhtut cyutli kyuctcup hwicli hras|lutnyik hpa7tli flatprik|wis hpa7tmwatli xre7t hjonli

drutta *Vitis baileyana* is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is

drutta *Eremurus spectabilis* is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: GumYoung shoots - cooked[46, 61, 74]. Considered to be a delicacy in Siberia, the flavour is intermediate between purslane and spinach[2]. It is by no means a disagreeable vegetable[2].

tcanta Adhesive Gum SizeThe root contains about 30% gum (an arabic acid derivative) and this makes a good quality glue[74]. The bulb is dried and powdered and then used for sizing cloth, bookbinding etc[114].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. Sow stored seed in a greenhouse as soon as it is obtained. Germination is slow and could take 1 - 12 months at 15°C. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow on for their first winter in a greenhouse. Plant out into their permanent positions in late spring after the last expected frosts. Do not plant deeply in the soil, the crown of the plant should be slightly exposed[245]. Division after the plant dies down in late summer. Great care must be taken because the plants resent root disturbance[200]. Only divide the plants when it is really necessary, and no more frequently than once every 6 years, being careful not to break the brittle roots[245]. It is probably best to pot up the divisions and grow them on in the greenhouse until they are established.

nwatta Prefers a very well drained, very rich, light sandy loam in a warm sunny sheltered position[90, 200]. A covering of sharp sand helps the plant to survive wet winters. Plants can also be mulched overwinter with organic matter in the autumn in order to give them extra protection, but this mulch must be removed in the spring otherwise it might encourage the new growth to rot[200]. Some protection should be given to the young shoots in spring in areas subject to late frosts[200]. Keep plants dry in summer after they have flowered[90]. A very ornamental plant[1] and a good bee plant[74]. Plants resent root disturbance and so should be placed in their final positions as soon as possible[200]. This species, in part at least, is also known as *E. caucasicus* Stephen[50]. Tubers should be planted 15cm deep[1]. The edible young shoots are sold in local markets in Siberia[46]. Plants require some cold stratification in winter in order to flower well in the following summer[200]. Slugs are very attracted to this plant so some protection must be given.

### 6.2.358 *Ephedra americana andina*

5 tlin 9 cyuc 2 kcak 0 tcan 3 dwat 1.8 m hkuc  
htut cyutli hgatkuyctcup hwicli hras|lut hpa7tli flatprik|wis hpa7tmwatli nyanhjen hjonli

drutta *Ephedra americana andina* is an evergreen Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[11, 177]. A sweet flavour, but fairly boring[K]. The fruit is about 8mm in diameter[200].

tcanta Plants can be used for ground cover, spaced about 60cm apart each way[208].

dwatta Depurative DiureticThe stems are depurative and diuretic[46]. The stems of most members of this genus contain the alkaloid ephedrine and are valuable in the treatment of asthma and many other complaints of the respiratory system[K]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise

to side-effects[254]. Ephedra does not cure asthma but in many cases it is very effective in treating the symptoms and thus making life somewhat easier for the sufferer. The stems can be used fresh or dried and are usually made into a tea, though they can also be eaten raw[K]. The young stems are best if eating them raw, though older stems can be used if a tea is made[K]. The stems can be harvested at any time of the year and are dried for later use[238].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and are also lime tolerant[200]. One report says that this species is frost-tender[200], but this is not our experience[K]. It succeeds outdoors at Cambridge Botanical Gardens and we have been growing it outdoors successfully since 1988[K]. Plants do not flower profusely or regularly in Britain[11]. Our plants have been producing reasonable crops since 1991[K]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.359 *Mentha suaveolens*

Round-Leaved Mint, Apple mint, Pineapple Mint

5 tlin 10 cyuc 2 kcak 2 tcan 2 dwat 1 m hkuc  
hmmhtut cyutli tcup hwicli hras|lutnyikrip hpa7tli flatprik|wis hpa7tmwatli xre7t hjonli

drutta *Mentha suaveolens* is a PERENNIAL growing to 1 m (3ft 3in) by 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condition TeaLeaves - raw or cooked as a potherb[50]. Used as a flavouring in salads or cooked foods[183]. The leaves have a similar flavour to spearmint, and are considered to be superior in flavour to that species but are also hairy, which makes them less suitable for garnishing[238]. A herb tea is made from the leaves[183].

tcanta Essential Repellent StrewingAn essential oil is obtained from the whole plant. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Antiseptic Carminative FebrifugeRound leafed mint, like many other members of this genus, is often used as a domestic herbal remedy, being valued especially for its antiseptic properties and its beneficial effect on the digestion. Like other members of the genus, it is best not used by pregnant women because large doses can cause an abortion. A tea made from the leaves of most mint species has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is



usually germinates in 2 - 6 weeks at 15°c[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Landscape Uses: Border, Foundation, Ground cover, Massing, Specimen. Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, Wetlands plant, Inconspicuous flowers or blooms.

### 6.2.354 Lilium species

5 tin 9 cyuc 2 kcak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Lilium species is a BULB growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Bulb - cooked. Rich in starch, it can be used as a vegetable in similar ways to potatoes. The flavour can range from very mild to very bitter[K]

tcanta None known

dwatta None known

propta Seed. Sow thinly in pots from late winter to early spring in a cold frame. The seed should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Protect against slugs in early spring, if the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Bulbs are best planted out into their permanent positions in early to mid-autumn in cool temperate zones and up to late autumn in warmer areas, this allows them to become established before new top growth commences in spring[200].

### 6.2.355 Osmunda japonica

Zenmai

5 tin 9 cyuc 2 kcak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikklwis hpa7tmwatli hjonli

drutta Osmunda japonica is a FERN growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young fronds - cooked[105, 177]. An edible starch is obtained from the rhizome[105, 177].

tcanta None known

dwatta None known

propta Spores - they very quickly lose their viability (within 3 days) and are best sown as soon as they are ripe on the surface of a humus-rich sterilized soil in a lightly shaded place in a greenhouse. Keep the compost moist, preferably by putting a plastic bag over the pot. Plants develop very

rapidly, pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old. Cultivars usually come true to type[200]. Division of the rootstock in the dormant season. This is a very strenuous exercise due to the mass of wiry roots[200].

nwatta Likes a soil of swamp mud and loamy or fibrous peat, sand and loam[1]. Succeeds in most moist soils, preferring acid conditions[200]. Requires a constant supply of water, doing well by ponds, streams etc[1]. Plants thrive in full sun so long as there is no shortage of moisture in the soil and also in shady situations beneath shrubs etc[200]. Plants are hardy to at least -20°c, they are evergreen in warm winter areas but deciduous elsewhere[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Closely related to *O. regalis*[1].

### 6.2.356 Lilium henryi

Henry's lily

5 tin 8 cyuc 2 kcak 0 tcan 0 dwat 1.8 m hkuc

hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Lilium henryi is a BULB growing to 1.8 m (6ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[163]. The bulb is about 7cm in diameter[266]. A rather bitter flavour[K]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta None known

dwatta None known

propta Seed - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Landscape Uses:Border, Foundation, Screen. Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Prefers a limey soil[200]. Succeeds in acid and limey soils according to one report[90], whilst another says that it does not tolerate acid soil conditions[245]. A very ornamental plant[1], it is very easily grown and is one of the most virus-tolerant of lilies[90]. It is also a fast-growing plant, onion-sized flowering bulbs can be obtained in 2 years from seed[K]. The flowers have a pleasant sweet perfume[245]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Special Features: Attractive foliage, Not North American native, Suitable for cut flowers, Attractive flowers or blooms.

### 6.2.357 Eremurus spectabilis

5 tin 9 cyuc 2 kcak 0 tcan 0 dwat 1 m hkuc

htut cyutli hgatkuyctcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[177, 257]. The fruit is about 4 - 7mm in diameter[200] and is borne in bunches. Leaves - raw or cooked. They can be chewed to allay thirst. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/january in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This species is closely related to *V. vulpina*[43]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.278 Pyrus regellii

5 tin 9 cyuc 2 kcak 0 tcan 0 dwat 9 m hkuc

hmimhtut cyutli hgatkuyctcup hwicli hrasjlutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Pyrus regellii is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is about 3cm in diameter[200].

tcanta RootstockUsed as a rootstock[74].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are very drought resistant[74]. Plants are hardy to at least -15°c[200]. Cultivated for its edible fruit in China and Japan, there are many named varieties. A hybrid between this plant and *P. communis* culta is more suitable for warmer climates. The leaves are remarkably variable in shape[11]. Trees are used in the re-afforestation of arid areas[74].

### 6.2.279 Aralia spinosa

Hercule's Club, Aralia spinosa, American Angelica Tree, Hercules' Club, Devil's Walking Stick

5 tin 9 cyuc 2 kcak 0 tcan 2 dwat 9 m hkuc

pcimhmmhtu cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Aralia spinosa is a deciduous Tree growing to 9 m (29ft 6in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177]. The leaves usually have a number of slender prickles, they must be gathered before the prickles harden[159] and are then chopped finely and used as a potherb[183].

tcanta WoodWood - close-grained, weak, light, soft, brittle[82, 227]. Of little economic value[229].

dwatta Alterative Analgesic Diaphoretic Ophthalmic Sialogogue StimulantAnalgesic[46, 61]. The bark, especially of the roots[82] is the part most commonly used medicinally, though other parts of the plant, including the fruit[82], also possess medicinal properties[4]. The fresh bark is strongly emetic, opthalmic, purgative and sialogogue[4, 46, 61, 222, 257], when dried it is a stimulating alterative and is diaphoretic[82]. A tincture of the berries is used in the treatment of toothache and rheumatism[4, 222, 257]. A poultice of the roots is applied to boils, skin eruptions, varicose veins, old sores and swellings[222, 257]. A cold infusion of the roots is used as drops for sore eyes[257].

propta Seed - best sown as soon as ripe in a cold frame. Stored seed requires 3 - 5 months of cold stratification. Germination usually takes place within 1 - 4 months at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse for at least their first winter. Once the plants are 25cm or more tall, they can be planted out into their permanent positions, late spring or early summer being the best time to do this. Root cuttings 8cm long, December in a cold frame[11, 78]. Store the roots upside down in sand and pot up in March/April. High percentage[78]. Division of suckers in late winter[11]. Very easy, the suckers can be planted out direct into their permanent positions if required.

nwatta Landscape Uses:Border, Massing, Specimen, Woodland garden. Prefers a good deep loam and a semi-shady position[1]. Requires a sheltered position[1]. A fast-growing but short-lived tree in its native zone[229], this species is of little value in Britain[1]. It is generally a single-stemmed plant, often spreading freely by means of suckers[182, 229]. Plants make finer foliage when growing in rich soils but are generally healthier and longer-lived in a comparatively poor soil[11]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Special Features:North American native, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Attractive flowers or blooms.

### 6.2.280 Ilex aquifolium

Holly, English holl, Christmas Holly, Common Holly, English Holly

5 tin 9 cyuc 2 kcak 4 tcan 2 dwat 9 m hkuc

pcimhmimhtut cyutli hgatkuyctcup hwicli hyishrasjlutnyikfrip hpa7tli frusflatprikklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex aquifolium is an evergreen Shrub growing to 9 m (29ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen from November to March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife.

Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

**ckaakta Edible Parts:** Edible Uses: TeaThe leaves have been used as a tea substitute[4]. The roasted fruit has been used as a coffee substitute[7]. Some caution is advised here, since the fruit can be purgative and emetic[K].

**tcanta Fuel Hedge Hedge Wood**An excellent hedge plant, tolerating hard clipping and maritime exposure and forming a dense stock-proof shelter[4, 11, 29, 75, 186]. Plants are fairly slow growing however[11]. The cultivar 'Pendula' makes a very good carpeting ground cover plant when grown as a cutting on its own roots[208]. It can be planted up to 1.2 metres apart each way, but is fairly slow to cover the ground[208]. Wood - strong, hard and dense, it polishes well, though it must be well dried and seasoned or else it warps badly. It is beautifully white, except at the centre of very old trees, and is highly regarded by cabinet makers though it must be well seasoned[4, 7, 46, 61]. The heartwood of mature trees is used for printing blocks, engravings, turnery etc[1, 115]. The wood makes a good fuel, burning well even when green[6]. **Landscape Uses:** Border, Screen, Standard, Specimen.

**dwatta Astringent Bach Diaphoretic Diuretic Emetic Expectorant Febrifuge Purgative**Holly is little used in modern herbalism. The leaves are diaphoretic, expectorant, febrifuge and tonic[4, 9, 21]. They can be use fresh at almost any time of the year or can be harvested in late spring and dried for later use[4, 9]. They are used in the treatment of intermittent fevers, rheumatism, catarrh, pleurisy etc[4, 238, 254]. The juice of the fresh leaves has been successfully used in the treatment of jaundice[4]. The berries are violently emetic and purgative[4, 7]. They have been used in the treatment of dropsy and as a powder they have been used as an astringent to check bleeding[4]. The berries are toxic, especially to children, and should not be used medicinally except under professional supervision[254]. The root has been used as a diuretic, though there are more effective diuretics available[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Hatred', 'Envy', 'Jealousy' and 'Suspicion'[209].

**propta Seed** - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

**nwatta** Succeeds in most soils, including peat, chalk, gravels, sand and shales[186], so long as they are not waterlogged, though wild plants are occasionally found in situations with standing winter water[186]. Grows well in heavy clay soils[186]. Established plants are fairly drought tolerant[186]. Dislikes dry soils according to one report[31] whilst another says that it succeeds in dry shade[188]. Tolerates a pH range from 3.5 to 7.2[186]. Succeeds in full sun or fairly dense shade[17, 28, 31], self-sown seedlings from woods and shady places making the most shade tolerant plants[28]. Tolerant of maritime exposure[75] though in such a situation it may lose some or all its leaves in the winter[186]. Plants require a minimum July temperature of 12°C for good fruit production[186]. They tolerate short periods in winter down to -15°C[184]. Severe frosts can kill whole branches, especially if they are open to the sky[186]. The young growth in spring can be damaged by

late frosts. A very ornamental plant, there are many named varieties[182]. Flowers and fruits are formed on wood of the previous year's growth[229]. A good bee plant[108], the minute flowers are sweetly scented[245]. The fruit is a valuable winter food source for birds. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Only move the plants in May or, preferably, in September[1]. Plants are quite slow growing, even when in good soils and situations[11, 75]. Trees are usually dioecious but hermaphrodite forms are available. Male and female plants must usually be grown if seed is required. Plants are capable of regenerating from the main stem both above and below ground level and, although the top may be killed in a fire, the plants will usually regrow from the base[186]. Rabbits are particularly fond of this species and will quickly remove the bark. This species is notably resistant to honey fungus[200]. **Special Features:** Attractive foliage, Not North American native, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 6.2.281 *Vitis flexuosa*

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 8 m hkuc hmimhmtu cyutli kyuctup hwicli hrasjlutnyik hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

**drutta Vitis flexuosa** is a deciduous Climber growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**ckaakta Edible Parts:** Fruit Leaves SapEdible Uses: Fruit - raw or dried for winter use[105, 177]. The fruit is about 7mm in diameter[200] and is carried in bunches. Some forms of this plant have edible leaves[177] - it is unlikely that the leaves of any forms are poisonous, but perhaps some are more palatable than others[K]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked. Sap - a sweet taste[178], it can be made into a drink[105, 177].

**tcanta Dye**A yellow dye is obtained from the fresh or dried leaves[168].

**dwatta Restorative Tonic**The fruit is restorative, strengthening and tonic[218]. The sap is used to restore youth and black hair[218]. The root is said to be warming to the sinews[218].

**propta Seed** - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

**nwatta** Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. A very ornamental plant[1], it climbs by means of tendrils[182]. Any pruning should be carried out in winter when the plants are

the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K].

## 6.2.351 *Salvia sclarea*

Clary, Europe sage, Clary Sage

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

**drutta Salvia sclarea** is a BIENNIAL/PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**ckaakta Edible Parts:** Flowers Leaves OilEdible Uses: Condiment OilLeaves - raw or cooked. A strong, warm, aromatic taste and odour[244]. They are used mainly as a flavouring in cooked foods[2, 27, 37, 105], they are similar to sage (*S. officinalis*)[1]. The leaves can be dipped in batter and cooked to make delicious fritters[183, 244]. Flowers - raw. A pleasant taste, they can be sprinkled on chopped salads[183, 238], or made into a tea[238]. The plant is sometimes used as a hop substitute in flavouring beer, imparting considerable bitterness and intoxicating properties[4] - it either makes people dead drunk or insanely exhilarated[244]. The leaves have also been used to adulterate wine and give it a muscatel flavour[244].

**tcanta Essential Oil**An essential oil is obtained from the flowering stems. Called 'Muscatel oil', it has an ambergris aroma and is used in soaps, cosmetics, as a fixative in perfumery etc[1, 46, 74, 171, 238]. A drying oil is obtained from the seed, it is used in varnishes, paints etc[74].

**dwatta Antispasmodic Appetizer Aromatherapy Aromatic Astringent Balsamic Carminative Ophthalmic Pectoral Tonic**Clary has been perceived both as a weaker version of sage (*Salvia officinalis*) and also as a significant herb in its own right[254]. An antispasmodic and aromatic plant, it is used mainly to treat digestive problems such as wind and indigestion[254]. It is also regarded as a tonic, calming herb that helps relieve period pain and pre-menstrual problems. Owing to its oestrogen-stimulating action, it is most effective when levels of this hormone are low[254]. The whole plant, and especially the leaves, is antispasmodic, appetizer, aromatic, astringent, balsamic, carminative, pectoral and tonic[4]. It is useful in treating disorders of the stomach and kidneys and is a valuable remedy for complaints associated with the menopause, particularly hot flushing[4, 254]. It should not be prescribed for pregnant women[238]. The leaves can be used fresh or dried, for drying they are harvested before the plant comes into flower[238]. The seed forms a thick mucilage when it is soaked for a few minutes in water. This is efficacious in removing small particles of dust from the eyes[4, 238]. The essential oil is used in aromatherapy. Its keyword is 'Euphoric'[210].

**propta Seed** - can be sown in situ during spring[1]. Alternatively seed can be sown in August/September to overwinter, it will then produce larger plants Thinnings can be transplanted[1]. The seed remains viable for 3 years[1].

**nwatta Landscape Uses:**Border, Seashore. Requires a very well-drained light sandy soil in a sunny position[200]. Thrives on any ground that is not too wet[4]. Plants can be killed by excessive winter wet[200]. Hardy to about -20°C[187]. A biennial or short-lived perennial[187]. The flowers can be air-dried and used as everlasting flowers[200]. A very ornamental plant, it is strongly aromatic and is sometimes cultivated for its essential oil, there are some named varieties[74, 183]. When bruised, the leaves release a deliciously pungent and refreshing smell of fresh grapefruit[245]. The flowers are very attractive to bees[245]. Members of this genus are rarely if ever troubled by browsing deer[233]. **Special Features:** Attractive foliage, Edible, Fragrant foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

## 6.2.352 *Lilium callosum*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

**drutta Lilium callosum** is a BULB growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckaakta Edible Parts:** RootEdible Uses: Bulb - cooked[105, 177]. The bulb is up to 3cm in diameter[266]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

**tcanta None known dwatta None known**

**propta Seed** - immediate epigeal germination[130]. Sow thinly in pots from late winter to early spring in a cold frame. Should germinate in 2 - 4 weeks[163]. Great care should be taken in pricking out the young seedlings, many people prefer to leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200]. Bulblets are formed on the stem just below the soil surface. These should be dug up in the autumn and replanted immediately, preferably in a cold frame for growing on until large enough to plant out into the garden[143, 163].

**nwatta** Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Lime tolerant[143, 200]. Plants are quite hardy if they are grown in full sun[143]. Stem rooting, the bulbs should be planted 15cm deep[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. Closely allied to *L. plumulum*[143]. The plant should be protected against slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200].

## 6.2.353 *Carex elata*

Tufted Sedge, Golden Variegated Sedge, Tufted Sedge 5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-prikkwisslip hpa7tmwatli hjonli

**drutta Carex elata** is an evergreen Perennial growing to 1.2 m (4ft) by 1.5 m (5ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

**ckaakta Edible Parts:** Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

**tcanta Bedding**The leaves are used for bedding[61]. Plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover[200].

**dwatta None known**

**propta Seed** - sown in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed

Root - cooked with other foods[177, 183]. This probably means that it is used as a flavouring[K].

tcanta EssentialYields an essential oil[46]. No more details are given.

dwatta Antibacterial Antispasmodic Astringent Cardiac Depurative Diaphoretic Diuretic Eczema Emmenagogue Hypnotic Nervine Oxytoxic Stimulant Stomachic TonicChinese motherwort is unusual amongst Chinese herbs in that it is often prescribed for use on its own and not in a mixture with other plants[238]. The whole plant is antibacterial, antispasmodic, astringent, cardiac, depurative, diaphoretic, diuretic, emmenagogue, hypnotic, nervine, oxytotic, stomachic, tonic, uterine stimulant[4, 9, 21, 46, 165, 174, 178, 192, 279]. The seeds have a similar action to the plant, but are a less effective diuretic and depurative[238]. The plant is used in the treatment of painful and excessive menstruation, post-partum bleeding, oedema, kidney complaints, kidney stones, eczema and abscesses[238, 240]. A tincture is used in the treatment of rheumatic fever[192]. The plant stimulates uterine contractions and should not therefore be used when in the earlier stages of pregnancy[240]. The plant is harvested when in flower but before the seeds have set, and is dried for later use[238]. The plant contains about 0.05% of an alkaloid called leonurine[240]. This has a curare-like effect on the motor-endings of the nervous system, acting in small doses as a stimulant to the respiratory system but in large doses causing respiratory paralysis[240].

propta Seed - sow late spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Prefers a well-drained moist soil in sun or partial shade[238]. Prefers a poor soil[108]. Plants are hardy to at least -15°C[238]. There is some confusion over the correct name for this species, it should quite probably be called *L. japonicus*.

### 6.2.349 *Artemisia dracunculoides*

Russian Tarragon, Tarragon, French Tarragon

5 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli hgtakuyctcup hwicli hrasjlut hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta *Artemisia dracunculoides* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - raw or cooked[46, 61, 105, 161]. The N. American Indians would bake the leaves between hot stones and then eat them with salt water[183, 216]. The leaves can also be eaten raw in salads but are inferior to *A. dracunculus* (Tarragon)[183]. The flavour is said to improve as the plant matures[200, 268]. Seed - raw or cooked. An oily texture[46, 61, 161, 183]. The seed is very small and fiddly to use[K].

tcanta RepellentBoth the growing and the dried plant repels insects[99].

dwatta Antiscorbutic Diuretic Emmenagogue Hypnotic StomachicThe herb is antiscorbutic, diuretic, emmenagogue, hypnotic and stomachic[21, 46, 179]. The fresh herb is eaten to promote the appetite[268].

propta Seed - surface sow from late winter to early summer in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Very easy, the divisions can be planted out direct into their permanent positions if required. Basal cuttings in late spring. Harvest the shoots when 10 - 15cm long, pot them up in a greenhouse and plant out when well rooted. Very easy.

nwatta Landscape Uses:Container, Seashore. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Nomenclature is somewhat confused for this species. It is considered by some botanists to be a hardier

form of *A. dracunculus* but with an inferior flavour[4, 200], whilst some consider it to be part of *A. glauca*[43]. It is very similar to *A. dracunculus*, but is more vigorous and hardier, its leaves have a pungent and less pleasant flavour than that species[238]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Edible, Fragrant foliage, Not North American native, Inconspicuous flowers or blooms.

### 6.2.350 *Codonopsis pilosula*

Dang Shen, Bellflower

5 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 1.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Codonopsis pilosula* is a PERENNIAL CLIMBER growing to 1.7 m (5ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[105, 177].

tcanta None known

dwatta Adaptogen Appetizer Digestive Galactagogue Sialagogue Stomachic TonicDang Shun is an important herb in Chinese medicine, it is a gentle tonic that increases energy levels and helps the body adapt to stress[254]. The root contains saponins, triterpenes and steroids[279], it is similar in action to ginseng (*Panax* species), but it is milder and has a shorter-lasting effect[4, 116, 174, 176, 218, 238, 254]. It is a sweet, warm, soothing herb that is taken as an energy tonic[238]. It acts mainly on the spleen, lungs and stomach, raising secretion of body fluids and blood sugar levels, and stimulating the immune system[238]. Research has shown that it increases haemoglobin and red blood cell levels and lowers the blood pressure. It also helps increase endurance to stress and promotes alertness[254]. The root and the whole plant are adaptogen, appetizer, digestive, galactagogue, sialagogue, stomachic and tonic[116, 147, 174, 176, 238, 254]. It is taken internally in the treatment of low energy, poor appetite and digestion, anaemia, shallow breathing and debility after illness[238, 254]. It is often cooked with rice until it is glutinous and used as a tonic food[238]. The dried root is decocted with other herbs and used to treat a wide range of ailments[218]. The roots of plants at least three years old are harvested in the autumn and can be used fresh or dried[238].

propta Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to cause the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

nwatta Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. Plants only succeed in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Although quite cold-hardy when dormant, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A climbing plant, supporting itself by twining and scrambling over other plants[219]. The plant resents root disturbance and should be planted out into its permanent position as soon as possible[164]. It is best grown on a high bank in order to give a good view of the flowers[1]. Plants are very susceptible to

dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.282 *Morus bombycis*

Kuwa

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta *Morus bombycis* is a deciduous Tree growing to 8 m (26ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or used in preserves[183]. The fruit is about 1cm in diameter[266].

tcanta FibreThe bark fibers are used for making paper[266].

dwatta Diuretic PectoralThe root bark is diuretic and pectoral[147]. A decoction is used in the treatment of 'hot' pulmonary coughing, asthma, excessive sputum production, oedematous face and difficult urination[147].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. There is some doubt over the validity of this name. [183] lists it as a synonym of *M. alba stylosa* (which we list as a synonym of *M. australis*) whilst [200] lists it as a synonym of *M. alba*. A plant seen at Hilliers Arboretum, Hampshire at the end of October 1996 seemed to be quite distinct from *M. alba* - it was still clothed in the lush green growth of early summer and was also still making new growth[K]. According to the Flora of China, this name is only a synonym for *M. australis*[266], though we are maintaining it as a separate species for the time being because we have seen specimens growing at Hilliers Arboretum that appear to be distinct[K]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.283 *Quercus libani*

Lebanon Oak

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 8 m hkuc hmimhtut cyutli kyuctcup hwicli jlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Quercus libani* is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked. The seed is about 2.5cm in diameter[200], it can be

dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent tanninA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it is quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of shade[200]. Prefers warmer summers than are usually experienced in Britain[200]. The seed ripens in its second year[200] and is frequently produced in Britain[11]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.284 *Vitis parvifolia*

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 8 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli xre7t hjonli

drutta *Vitis parvifolia* is a deciduous Climber growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Drink-Fruit - raw or dried for winter use[105, 177]. The fruit is about 7mm in diameter[200] and is carried in bunches. Some forms of this plant have edible leaves[177] - it is unlikely that the leaves of any forms are poisonous, but perhaps some are more palatable than others[K]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked. Sap - a sweet taste[178], it can be made into a drink[105, 177].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta OphthalmicThe fruit is restorative, strengthening and tonic[218]. The sap is used to restore youth and black hair[218]. The root is said to be warming to the sinews[216].

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large

enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. A very ornamental plant[1], it climbs by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.285 Malus sikkimensis

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 7 m hkuc hmimhtut cyutil tcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Malus sikkimensis is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is up to 15mm in diameter[200] and is freely produced in Britain[11].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade, though it fruits less well in such a situation[200]. Closely related to *M. baccata*[1]. The fruit, which is freely produced in Britain[11], is a good wildlife food source, especially for birds[200]. Hybridizes freely with other members of this genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.286 Malus bracteata

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 7 m hkuc hmimhtut cyutil tcup hwicli hrasjlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Malus bracteata is a deciduous Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. The fruit is about 3cm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. There is some confusion over the correct name of this species, [43] lists this name as a synonym of *M. coronaria lancifolia* whilst [200] treats it as a species in its own right. This species is closely related to *M. ioensis*[200]. It hybridizes freely with other members of the genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.287 Morus microphylla

Texas Mulberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutil tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Morus microphylla is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. Small and dry[149, 161, 177]. Sweet and palatable[82, 200]. The fruits can be sweet or sour[227]. The fruit can be dried for later use[257]. It is up to 15mm in diameter[200].

tcanta WoodThe twigs have been split in half lengthways and used to make serviceable baskets[257]. Wood - heavy, hard, elastic, close grained. Used for carpentry[149], but it is too small to be commercially important[229].

dwatta None known

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. Formerly cultivated for its edible fruit by the North American Indians[149]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly paced branches and dead wood[238]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious, male and female plants must be grown if seed is required[227].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. This species is a blackberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. A parent of many cultivated forms of blackberry in N. America, the cultivar 'Kitatinny' has been available in Britain[11]. The plant produces apomictic flowers, these produce fruit and viable seed without fertilization, each seedling is a genetic copy of the parent[200] Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.345 Dendranthema lavandulifolium

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc htut cyutil tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Dendranthema lavandulifolium is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta The following uses are for the closely related *D. indica*. They quite possibly also apply to this species. The flower heads are pickled in vinegar[46, 61, 177, 183]. Young leaves - cooked[105, 177, 183]. An aromatic tea is made from the leaves[183]. Seed[183]. No more details are given but it is very small and would be rather fiddly to use.

tcanta The following uses are for the closely related *D. indicum*. They quite possibly also apply to this species. The seed contains about 16% of a semi-drying oil, but no information is given as to its uses[240]. The seed is rather small, commercial extraction is probably not viable[K].

dwatta EczemaThe flowers are hypotensive and vasodilator[176]. They have an antibacterial action, inhibiting the growth of *Staphylococcus*, *E. coli*, *streptococcus*, *C. diphtheriae*, *Bacillus dysenteriae*[176]. The flowers are used in the treatment of furuncle, scrofula, deep-rooted boils, inflammation of the throat, eyes and cervix, eczema, itchiness of the skin and hypertension[176].

propta Seed - sow spring to early summer in a greenhouse and only just cover the seed[200]. It usually germinates in 10 - 18 days at 15°C but if it does not germinate within 4 weeks then try chilling the seed for 3 weeks in the salad compartment of a fridge[164]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most well-drained fertile soils in a sunny position[1, 200]. This species is closely related to *D. indicum*. When bruised, the foliage has a pungent refreshing fragrance that is somewhat lemon-like and reminiscent of chamomile[245].

## 6.2.346 Rheum ribes

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutil cyুক্তcp hwicli jlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Rheum ribes is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: StemEdible Uses: Leaf stem - cooked[2, 93, 105]. Eaten raw by the local people[187].

tcanta None known

dwatta None known

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humic rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Best grown in a dry position, where it can be very long-lived[187]. Hardy to about -20°C according to one report[200] whilst another says that plants are somewhat tender in Britain[1]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 6.2.347 Adenophora remotiflora

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutil tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Adenophora remotiflora is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[105, 177, 179]. Buds - cooked[177]. We do not know if this report refers to the flowers or the leaves[K].

tcanta None known

dwatta Antidote Demulcent ExpectorantThe root is antidote, demulcent, expectorant[174, 178, 218]. The root is used in the treatment of poisonous bites and medicinal poisoning[174, 178].

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Plants are intolerant of root disturbance[1]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K]. There is some confusion over this name. Some reports, especially [105] and [179] refer to *A. remotifolia*. Miq. We assume that this is a mis-spelling for this species but we could be wrong[K].

## 6.2.348 Leonurus sibiricus

Chinese Motherwort, Honeyweed

5 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc hmimhtut cyutil tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Leonurus sibiricus is a ANNUAL/BIENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[105, 177, 183]. A sweetish flavour[179].

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis hpa7tmwatli xre7t hjonli

drutta Hydrangea serrata is a deciduous Shrub growing to 2 m (6ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young leaves and shoots - cooked[105]. These leaves do not become sweet like those of sssp thunbergii or amagiana or those of H. macrophylla[174].

tcanta Hedge HedgeCan be grown as a low hedge[29], it is quite wind tolerant.

dwatta None known

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Landscape Uses:Container, Seashore, Specimen. Tolerates most soil[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. Does well on very acid soils with a pH around 4.5[200]. Tolerates alkaline soils, but it may become chlorotic on shallow soils over chalk[200]. The colour of the flowers reflects the pH of the soil the plant is growing in, the flowers are pink in a neutral to alkaline soil and blue in an acid soil[200]. Plants are hardy to about -25°C when dormant but the young growth in spring can be killed by late frosts. A very ornamental plant, there are many named varieties[182]. Considerable difficulties exist in the nomenclature for this species and H. macrophylla. They are treated here in accordance with "Bean's Manual of Trees and Shrubs", though many botanists view H. serrata as no more than a sub-species of H. macrophylla. This species is notably susceptible to honey fungus[200]. Special Features: Not North American native, Blooms are very showy.

## 6.2.342 Ribes inerme

Whitestem Gooseberry, Klamath gooseberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Ribes inerme is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[101, 105, 161, 257]. A gooseberry[161]. The fruit is about 8mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 6 months cold stratification at 0°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August

in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Prefers a sunny position[11]. Hardy to about -20°C[200]. Some botanists include this species as part of R. divaricatum as R. divaricatum inerme. (Rydb.)McMinn.[71]. The stems are occasionally thorned or smooth[200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.343 Rubus thibetanus

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Rubus thibetanus is a deciduous Shrub growing to 2.5 m (8ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. The purplish black or dark red fruit is about 16mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification, is best sown in early autumn in a cold frame. Sow stored seed as early as possible in the year in a cold frame and stratify for a month at 3°C if sowing later than February. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Tip layering in July. Plant out in autumn. Division in early spring.

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Spreads by means of suckers[182]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.344 Rubus bellobatus

Kittatiny Blackberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyfxfre7t hjonli

drutta Rubus bellobatus is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The oblong fruit is about 30mm long[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

## 6.2.288 Vaccinium melanocarpum

Georgia Blueberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium melanocarpum is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 3, 105, 161]. The fruit is about 8 - 10mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. This species is closely related to V. neglectum[11]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.289 Thamnocalamus aristatus

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Thamnocalamus aristatus is an evergreen Bamboo growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Seed StemEdible Uses: Young shoots - cooked[177]. The new shoots are about 15mm in diameter[K]. Seed - used as a cereal[177]. The plants only flower and produce seed at intervals of several years.

tcanta Basketry Hedge Hedge Plant supportThe canes are used for making walking sticks, baskets and pipes[25, 46, 51, 272]. They can also be used as plant supports[146]. Valuable for screen planting in wet areas[200].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when

a good root system has developed, which can take a year or more[200]. Basal cane cuttings.

nwatta Succeeds in most soils in sun or shade so long as the soil is moist[200]. Prefers a good loamy soil in a semi-shaded position[1, 11, 25], the leaves curling up when the plant grows in strong sunlight. Dislikes drought[1]. Requires a position sheltered from cold winds[25]. This species is only hardy in the milder areas of Britain. Plants are hardy to about -20°C according to another report. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The rootstock is caespitose[25]. Closely related to T. spathiflorus[200].

## 6.2.290 Erodium moschatum

Musk Storksbill

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat m hkuc

htut cyutli kyucutp hwicli hrasjlut hpa7tli prikklwis hpa7tmwatli xre7t hjonli

drutta Erodium moschatum is a ANNUAL/BIENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[161, 177]. Added to salads or used as a potherb[183]. tcanta DyeA green dye can be obtained from the whole plant. It does not require a mordant[168].

dwatta Astringent Dysentery FebrifugeThe plant is febrifuge[240]. A tincture of the plant is used in the treatment of dysentery[240].

propta Seed - sow in situ as soon as the seed is ripe in the late summer. The seed can also be sown in situ in late spring[1]. It usually germinates readily[200].

nwatta Prefers a sunny well-drained position and a limy soil or at least one that is not acid[1]. The bruised leaves emit a strong scent of musk[245].

## 6.2.291 Cornus florida

Flowering Dogwood

5 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 6 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Cornus florida is a deciduous Shrub growing to 6 m (19ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: DrinkFruit - cooked. The fruit is not poisonous, but is almost inedible raw[226]. When the seed is removed and the flesh is mashed, it can be mixed with other fruits and made into jams, jellies etc[226]. The fruit, when infused in 'Eau de Vie' makes a bitter but acceptable drink[4]. One report says that the fruit is poisonous for humans[229]. The fruit is borne in clusters, each fruit being up to 15mm in diameter with a thin mealy bitter flesh[229]. The fruit is high in lipids, up to 35% of dry weight[274].

tcanta Brush Dye Ink Repellent Teeth WoodA red dye is obtained from the fibrous root[4, 95]. The peeled twigs are used as toothbrushes, they are good for whitening the teeth[4, 95, 102]. The juice from the twigs preserves and hardens the gums[4]. The twigs can also be chewed to make

natural paintbrushes[102]. A black ink can be made from the bark mixed with gum arabic and iron sulphate[4]. The bark is very bitter, could it be used to make an insect or bird repellent[K]? Wood - hard, heavy, strong, close grained, durable, takes a good polish and is extremely shock-resistant. It weighs 51lb per cubic foot and is used for making wheel hubs, tool handles, the heads of golf clubs, bearings, turnery etc[4, 46, 61, 82, 102, 171, 227]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anthelmintic Antidiarrhoeal Antiperiodic Appetizer Astringent Bitter Diaphoretic Malaria Poultice Stimulant TonicFlowering dogwood was employed medicinally by a number of native North American Indian tribes who valued it especially for its astringent and antiperiodic properties[257]. It is little used in modern herbalism. The dried root-bark is antiperiodic, astringent, diaphoretic, mildly stimulant and tonic[4, 46, 61, 95, 257]. The flowers are said to have similar properties[4]. A tea or tincture of the astringent root bark has been used as a quinine substitute to treat malaria[95, 222, 257] and also in the treatment of chronic diarrhoea[222]. The bark has also been used as a poultice on external ulcers, wounds etc[222, 257]. The glycoside 'cornin' found in the bark has astringent properties[213]. The inner bark was boiled and the tea drunk to reduce fevers and to restore a lost voice[213, 257]. A compound infusion of the bark and the root has been used in the treatment of various childhood diseases such as measles and worms[257]. It was often used in the form of a bath[257]. The fruits are used as a bitter digestive tonic[222]. A tincture of them has been used to restore tone to the stomach in cases of alcoholism[4].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Border, Specimen, Woodland garden. An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Dislikes shallow clay soils and chalky soils[98, 182]. Requires a neutral to acid soil according to another report[202]. Prefers a rich loamy well-drained soil[98]. Succeeds in full sun or light shade[188]. Plants can be trained to grow against a wall when they prefer a position in light shade[202]. Plants are very hardy, tolerating temperatures down to about -25°C. but they are subject to damage by late frosts and are rarely successful away from the warmer counties of Britain[11, 200]. They require a long hot humid summer if they are to grow well, doing best in the east or south-east of Britain[182, 200] in areas that are not subject to late or early frosts. They do not generally do very well in the south-west, where the flower bracts are often damaged by frosts[200]. Medium to fast growing when young, but slowing with age[202]. Trees are short-lived[229]. A very ornamental plant, there are many named varieties[200, 202]. It is the state flower of Virginia[212]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, North American native, Attracts butterflies, Blooms are very showy. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-

ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is a heart root, dividing from the crown into several primary roots going down and out [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 6.2.292 Cardamine macrophylla

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-prikkwiss hpa7tmwatli fyfxfre7t hjonli

drutta Cardamine macrophylla is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

ckakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - cooked[105, 177].

tcanta None known dwatta None known propta Seed - sow outdoors in a seedbed in a shady position in April. Plant out in autumn or spring. Division in the spring. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them out in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Succeeds in most soils[1]. Prefers a moist humus rich soil in shade or semi-shade[200]. Best grown in cool places by water[1]. A very ornamental plant[1], it is hardy to about -15°C[187].

## 6.2.293 Plantago media

Hoary Plantain

5 tlin 9 cyuc 2 kcaak 2 tcan 2 dwat m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikkwisslip hpa7tmwatli fyfxfre7t hjonli

drutta Plantago media is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind, flies, beetles, bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

ckakta Edible Parts: Flowers LeavesEdible Uses: Young leaves - raw or cooked[7]. The very young leaves have a fairly mild flavour but with a slight bitterness[K]. Used in salads before they become tough[7]. The inflorescence is sweet and is sucked by children[177, 183].

tcanta FungicideThe leaves are a cure for blight on fruit trees[14]. An important food plant for the caterpillars of many species of butterflies[30]. The flowers are sweetly scented[245]. Dynamic accumulator.

dwatta Astringent Demulcent Deobstruent Depurative Diuretic Expectorant Haemostatic Laxative Odontalgic Ophthalmic RefrigerantThe leaves, flowering stems and roots are somewhat astringent, deobstruent, depurative, diuretic, expectorant, haemostatic, refrigerant and vulnerary[4, 7]. They are applied externally to skin inflammations, malignant ulcers, cuts etc[4, 7]. A mouthwash made from the leaves helps to relieve toothache and a distilled water is a good eye-wash[7]. The seeds are demulcent and laxative[4, 7]. Plantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238].

## 6.2.338 Oemleria cerasiformis

Oso Berry, Indian plum

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 2.5 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikkwiss hpa7tmwatli nyanhjen hjonli

drutta Oemleria cerasiformis is a deciduous Shrub growing to 2.5 m (8ft) by 4 m (13ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from March to April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 61, 118, 183]. A poor flavour[106]. The fruit looks like a small plum but is very bitter with an almond flavour[11]. The fully ripe fruit loses most of its bitterness[256]. The fruit only has a thin layer of flesh[200]. The fruit can be dried and stored for winter use[257]. Some caution is advised, see the notes above on toxicity.

tcanta None known dwatta Laxative Poultice TBThe bark is mildly laxative[257]. A decoction has been used in the treatment of tuberculosis[257]. A poultice of the chewed burned plant, mixed with oil, has been used to treat sore parts of the body[257].

propta The seed requires 4 months stratification at 4°C. It is probably best sown in a cold frame as soon as it is ripe in the autumn. Sow stored seed as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Layering in spring. Takes 6 months[78]. Suckers, taken at any time in the dormant season[188].

nwatta Succeeds in an ordinary well-drained garden soil[11, 200], but becomes chlorotic on shallow soils over chalk[200]. Prefers a well-drained moisture retentive soil in a shady position[200]. Requires a sunny position according to another report[182]. Plants are hardy to about -20°C[184]. This species grows well in a woodland garden or in a damp shady border[200]. The plants often sucker freely and can form dense thickets[188]. Old plants can be rejuvenated by cutting them back hard into the old wood in late winter, they will resprout freely from the base[200]. Growth can be restricted by removing suckers and cutting old shoots back or down to the base in late winter[188]. Some, if not all plants are dioecious. Male and female plants must be grown if seed is required.

## 6.2.339 Rubus adenophorus

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikkwiss hpa7tmwatli xre7t hjonli

drutta Rubus adenophorus is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 11, 105]. The fruit is about 12mm in diameter[200].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant

them out into their permanent positions in late spring of the following year. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. This species is a raspberry with biennial stems[200]. New shoots are produced from the roots each year, these flower and fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.340 Lilium pardalinum

Panther Lily, Leopard lily, Pitkin Marsh lily, Vollmer's lilyShasta lily, Wiggins' lily  
5 tlin 9 cyuc 2 kcaak 2 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat-prikkwiss hpa7tmwatli xre7t hjonli

drutta Lilium pardalinum is a BULB growing to 2 m (6ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

ckakta Edible Parts: RootEdible Uses: Bulb - cooked[143, 257]. Rich in starch, it can be used as a vegetable in similar ways to potatoes (*Solanum tuberosum*).

tcanta Landscape Uses: Border, Container, Massing, Seashore, Specimen. Ornamental. Hardy bulb. US native to moist meadows and streambeds.

dwatta None known propta Seed - autumnal hypogaeal germination. Best sown as soon as ripe in a cold frame, it should germinate in spring[163]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division in autumn once the leaves have died down. Replant immediately[200]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out. Bulbils - gather in late summer when they start to fall off the stems and pot up immediately. Grow on in a greenhouse until large enough to go outside[163].

nwatta Succeeds in almost any soil that is moist but not water-logged[47, 143]. Prefers a wet soil on a slope or a well-drained soil with a high water table[90]. Tolerates lime[47, 90, 163]. Succeeds in full sun but rapidly deteriorates if grown in deep shade[143]. Fairly wind resistant but is best grown in a sheltered position[47, 143]. Very ornamental and easily grown[1], the plant is rhizomatous, forming clumps[47]. The plant increases rapidly by division, each bulb producing 5 new bulbs per year[143]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. A very variable plant, it is divided into a number of sub-species[270]. The plant should be protected against rabbits and slugs in early spring. If the shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. Special Features: North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Fragrant flowers. Heat Zone: 8-5.

## 6.2.341 Hydrangea serrata

Hydrangea, Mountain Hydrangea, Sawtooth Hydrangea  
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2 m hkuc



(has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Seed StemEdible Uses: TeaFruit - raw or cooked[118, 183]. It is used to make jams and jellies, it is also used to make a pleasant tasting fruity-flavoured tea[177, 183]. The fruit is about 13mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102]. The shoots can be used to make a tea-like beverage[257]. Young tender shoots - peeled and eaten in the spring[257].

tcanta None known

dwatta Astringent Cancer Foot care VD Women’s complaintsA decoction of the roots has been used in the treatment of sore throats and syphilis[257]. An infusion of the bark has been taken by a mother just after childbirth[257]. A decoction of the branches, combined with chokecherry (*Prunus virginiana*) and red willow (*Salix bonplandiana*), has been used in the treatment of various women’s complaints, diarrhoea and vomiting[257]. The leaves have been placed in the shoes as a protection from athletes foot[257]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°c (by which time the seed should have imbibed). It is then kept at 3°c for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°c[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeeds in most soils[11], preferring a circumneutral soil and a sunny position[200]. Grows well in heavy clay soils. Dislikes water-logged soils[200]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.337 Gossypium hirsutum

Upland Cotton

5 tlin 10 cyuc 2 kcaak 4 tcan 1 dwat 2 m hkuc htut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Gossypium hirsutum is a SHRUB growing to 2 m (6ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant is not wind tolerant.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - cooked. The seeds contain up to 40% protein, they have a nutty flavour when roasted and can be eaten as a snack[301 ]. They are also boiled and used like rice in casseroles and soups[301 ]. Ground into a powder, they can be added to flour when making bread, cakes etc[301 ]. They can also be made into a spread similar to peanut butter[301 ]. Some forms of this plant produce seeds containing the toxin gossypol, which needs to be removed before the seed is eaten[301 ]. The seeds of glandless cultivars do not contain this toxin[301 ]. An oil obtained from the seed is used for salads, in cooking and to make margarine etc[301 , 418 ]. Carbon Farming - Staple Crop: oil.

tcanta OilAgroforestry Uses: Low-grade seed cake, after the oil has been expressed, is used as manure[418 ]. Other Uses A good quality fibre is obtained from the seed floss[46 ]. Cotton fibres have a wide range of use including making clothes; rubber-tyre fabrics; stuffing material for pillows, cushions etc; surgical dressings; making twine and ropes; carpets etc[46 ]. An oil is obtained from the seed. Low-grades of the oil are used in the manufacture of soap, lubricants, sulphonated oils and protective coatings[418 ]. The seed hulls and the dry stalks are used as fuel[418 ]. Carbon Farming. Industrial Crop: fiber. Other Systems: strip intercrop.

dwatta The boiled leaves are applied to skin rashes on children[348 ].

propta Seed. In zones 8-10 it can be sown directly after the last frost. In zones 5-7, treat like tomatoes. Seed germinates in 7-21 days at 70 F. Plant 18-30 in. apart in rows 5 ft. apart. Plants start flowering in mid-summer.

nwatta Industrial Crop: Fiber Management: Coppice Management: Standard Other Systems: Strip intercrop Regional Crop Staple Crop: OilSea Island cotton can be grown in the dry to moist tropics and subtropics, where it is found at elevations up to 1,250 metres. For commercial production it requires a climate that has a long, hot growing season with abundant moisture, followed by a drier period for harvesting the seed floss[200 ]. Low temperature increases the production of vegetative branches and extends the cropping period, while high temperature increases the number of fruiting branches and reduces the cropping period. It grows best in areas where annual daytime temperatures are within the range 22 - 36°c, but can tolerate 15 - 42°c[418 ]. It prefers a mean annual rainfall in the range 750 - 1,200mm, but tolerates 450 - 1,500mm[418 ]. Prefers a very sunny position in a light, fertile soil[200 ]. Plants can tolerate a range of well-drained soils, including moderate levels of salt[418 ]. Prefers a pH in the range 6 - 7.5, tolerating 5 - 9.5[418 ]. Requires a position sheltered from strong winds[418 ]. The plant is usually cultivated as an annual, taking 150 - 220 days to mature a crop[418 ]. Seed-cotton yields vary between 0.8 - 3 tonnes/ha, or 0.2 - 1.1 tonnes/ha of fibre[418 ]. Carbon Farming - Cultivation: regional crop. Management: standard, coppice. Perennial cotton has longer fibres and is considered superior to annual cottons. Perennial cottons are suited to arid and humid conditions while annual cottons were bred for colder climates and for mechanical harvesting. Perennial cottons are cultivated in the tropics on a smaller scale and include *Gossypium arboreum burmanicum*, *Gossypium arboreum indicum*, *Gossypium arboreum soudanense*, *Gossypium barbadense braziliense*, *Gossypium barbadense darwinii*, *Gossypium herbaceum acerifolium*, *Gossypium herbaceum africanum*, *Gossypium hirsutum marie-galante*, *Gossypium hirsutum punctatum*, *Gossypium hirsutum taitense*. Currently perennial cottons are harvested by hand. Researching perennial cottons varieties and production methods would help develop them as good carbon farming plants and help to alleviate the terrible problems caused by annual cottons.

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200]. Grows well in the spring meadow[24].

### 6.2.294 Liriope muscari

Lilyturf, Big blue lilyturf, Border Grass, Blue Lilyturf, Liriope 5 tlin 10 cyuc 2 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyuti hgatyuctpuc hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Liriope muscari is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: RootEdible Uses: Root - cooked[105, 177]. Candied and used medicinally[61]. The roots sometimes have a fleshy, tuberous part near their tip[266].

tcanta A good drought tolerant evergreen ground cover plant[200, 208]. Rather slow to spread though, needing weeding for the first year or two[197]. Plants should be spaced about 30cm apart each way[208].

dwatta Antiinflammatory Aphrodisiac Pectoral Stimulant TonicThe root is antiinflammatory, antiallergic, aphrodisiac, pectoral and stimulant[61, 279]. It is used as a tonic in Korea to increase stamina and also as an expectorant[279].

propta Seed - we have no information on this species but suggest sowing it in a cold frame or greenhouse as soon as the seed is ripe if possible, if not then sowing the stored seed in early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Very easy, the larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Rock garden, Seashore, Specimen, Woodland garden. Prefers a sandy soil[1]. Succeeds in full sun so long as the soil does not dry out in the summer, otherwise it should be grown in partial shade in any moderately fertile well-drained soil[200]. Requires a sunny position[208]. Established plants are fairly drought tolerant[190, 200], they succeed in dry shade[190]. Hardy to at least -15°c[200]. A very ornamental plant, there are many named varieties[200]. Slow to settle down after being planted but then grows away well[190]. Members of this genus are rarely if ever troubled by browsing deer[233]. There is a lot of confusion between this species and *L. graminifolia*, most of the plants being grown as *L. graminifolia* actually being this species[200]. Apart from its use as a ground cover plant, all the entries on this plant’s uses actually belong to *L. graminifolia* but, because of the confusion, it is quite possible that they also apply to this species[K]. This species has thick dark tubers whilst *L. graminifolia* is rhizomatous[200]. Special Features:Attractive foliage, Not North American native, Naturalizing, Suitable for cut flowers, Inconspicuous flowers or blooms.

### 6.2.295 Quercus michauxii

Swamp Chestnut Oak

5 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat m hkuc hmimhtut cyuti tcuphja7n hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus michauxii is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender.

The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[2, 46, 161]. The seed is large, up to 35mm long and 30mm wide[82], but contains bitter tannins[183]. Other reports say that the acorns are sweet and edible[82, 235]. The seed can be roasted then dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread[183]. The bitter tannins can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodAgroforestry Uses: The tree has been used in restoring degraded bottomland hardwood forests of the Southeastern USA[1050 ]. Other Uses: The leaves of most species in this genus are more or less rich in tannins. A much of the partially decayed leaves can be placed around vulnerable plants in order to repel slugs, snails, grubs etc, and these will in time break down to add humus and nutrients to the soil. Fresh leaves should be used with caution, however, since as these decay they utilize some of the nitrogen in the soil and thus can inhibit plant growth[20 , K ]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff and is also used by many cultures to make ink[4 , 331 ]. The bark of oak trees is also usually rich in tannins and can be used as a dyestuff and for waterproofing rope[331 , K ]. The wood is heavy, hard, very strong, tough, dense, durable, easy to split[82 , 171 , 235 ]. It weighs 50lb per cubic foot[235 ]. It machines well, but is subject to checking and warping if not dried properly. It i is largely used for flooring, furniture, boxes, barrels, boat making and veneer[229 , 1050 ]. The wood is a favoured fuel - burning well and giving off a lot of heat[331 , 229 ].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Firewood, Pest tolerant, Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Closely related to *Q. prinus*[11]. This species is often confused with *Q. prinus*, *Q. prinoides* and *Q. muehlenbergii*[200]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Wetlands plant, Inconspicuous flowers or

blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 6.2.296 Sorbus sambucifolia

Siberian mountain ash

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhht cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sorbus sambucifolia is a deciduous Shrub. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 161]. Sweet tasting[11].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. There is considerable confusion over the naming of this species, trees grown under this name have included *S. decora*., *S. matsumurana*., *S. scopulina*. and *S. sitchensis*[1].

### 6.2.297 Sambucus melanocarpa

Black Elder, Rocky Mountain elder

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc

hmimhht cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sambucus melanocarpa is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers FruitEdible Uses: Fruit - raw or cooked[105, 161]. Low in pectin, it is best mixed with crab-apples or other pectin-rich fruits if used in making jams, jellies etc[183]. The fruit is about 6mm in diameter and is borne in large clusters[200]. Some caution is advised, see the notes above on toxicity. Flowers - raw or cooked.

tcanta None known

dwatta Astringent Dysentery Poultrice Salve TBThe dried ripe berries have been eaten as a treatment for diarrhoea[257]. A decoction of the roots has been used in the treatment of diarrhoea and dysentery[257]. A poultice of the boiled, mashed roots has been used as a treatment for caked breasts, cuts and wounds[257]. A decoction of the flowers has been used in the treatment of tuberculosis, coughs and colds[257]. It has also been given to children as a spring tonic[257]. A poultice of the crushed leaves has been used to treat bruises and bleeding wounds[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season’s growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.298 Crataegus nigra

Hungarian Hawthorn

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 6 m hkuc

hmimhht cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Crataegus nigra is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. A soft flesh[200]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. The fruit is about 1cm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed ‘green’ (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

### 6.2.333 Berberis amurensis

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 3.5 m hkuc hmimhht cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis amurensis is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - cooked. Used in preserves[177]. The oblong fruit is about 10mm long[200]. Leaves[177]. No more details.

tcanta Hedge HedgePlants are very amenable to trimming and can be grown as an almost impenetrable formal or informal hedge[200].

dwatta Antibacterial Antirheumatic Cancer Dysentery-The root is antirheumatic[218]. Berberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season’s growth, preferably with a heel, October/November in a frame[78]. Layering.

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. This species is closely allied to *B. vulgaris*, it hybridizes freely with other members of the genus[1]. There are some named forms selected for their ornamental value[200]. Plants can be pruned back quite severely and will resprout well from the base[200].

### 6.2.334 Berberis parisepala

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 3 m hkuc hmimhht cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis parisepala is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: The following report is for the closely related *B. angulosa* - it quite possibly can also be applied to this species[K]. Fruit - raw or cooked. The relatively large berries are freely borne and are more palatable than most barberries. The fruit is about 15mm long and 8mm wide[200].

tcanta DyeA yellow dye is obtained from the root. dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by

the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season’s growth, preferably with a heel, October/November in a frame[78]. Layering.

nwatta Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[200]. Plants can be pruned back quite severely and will resprout well from the base[200]. This species comes into leaf very early in the spring[11]. Hybridizes freely with other members of this genus[1]. This species is closely related to *B. angulosa*[200].

### 6.2.335 Eleutherococcus divaricatus

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3.5 m hkuc

hmimhht cyutli tcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Eleutherococcus divaricatus is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - cooked[105, 177]. They are parboiled, then dried and used as a winter vegetable[183]. The leaves are used as a condiment[183]. The dried leaves are a tea substitute[177, 183].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season’s growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Succeeds in an open loamy soil[1], preferring a well-drained humus-rich soil in full sun[200]. Tolerates poor soils and atmospheric pollution[200]. Plants are hardy to at least -10 to -15°C if they are sheltered from cold winds[200]. A spineless form, *Eleutherococcus divaricatus inermis* (Nakai) H. Ohashi, has been reported[275].

### 6.2.336 Rosa pisocarpa

Cluster Rose, Ahart’s cluster rose

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 2.5 m hkuc

hmimhht cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rosa pisocarpa is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from August to October. The species is hermaphrodite

and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Edible Uses: CondimentThe leaves, root and bark are dried and used as a substitute for cinnamon[177]. Some caution is advised, see reports above on toxicity[270].

tcanta None known

dwatta Diuretic Emmenagogue UrinaryEmmenagogue[61]. An infusion of the bark has been used to treat urinary problems[257].

propta Seed - best sown in a cold frame as soon as it is ripe. If the seed is harvested 'green' (as soon as it has fully developed but before it has dried on the plant) and sown immediately it can germinate in 3 weeks[113]. Dried seed germinates in 1 - 6 months at 15°C[138]. Stored seed requires between 3 weeks and 3 months cold stratification before sowing in the spring. When large enough to handle, prick out the seedlings into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. They can be difficult[113]. Layering in spring. Sever the new plants in a wet spell of weather about 15 months later and then lift them in the autumn[78]. High percentage[78]. Division of suckers in early spring[11]. Very easy, they can be planted straight out into their permanent positions if required.

nwatta Prefers a light loamy soil that is deep and moist but it succeeds in most fertile soils[11, 182]. Prefers a sunny position but it tolerates shade when grown in warm temperate zones[11, 200]. Requires a sheltered position, protected from cold winds[245]. A very ornamental plant, it is often confused with the closely related *C. floridus* and is perhaps no more than a sub-species of that species[11]. The leaves smell strongly of cinnamon[245]. The seed only ripens in Britain after a hot summer[11]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.331 *Oplopanax japonicus*

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 3 m hkcuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Oplopanax japonicus* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil. The plant can tolerate maritime exposure.

**kcakta** Edible Parts: Leaves RootEdible Uses: Young shoots - peeled and then cooked[46, 61, 105, 106]. Only the very young shoots are used[172]. The roots can be chewed after peeling[105, 106, 161].

tcanta None known

dwatta Analgesic Antiphlogistic Antirheumatic Hypoglycaemic TonicThe root bark and stems are analgesic, antiphlogistic, antirheumatic, hypoglycaemic and tonic[172].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of suckers in the dormant season. Root cuttings in a greenhouse in the winter[188].

nwatta Requires a cool moist soil[11, 200]. Prefers a position in light shade[182]. Prefers dense shade and is probably best if grown in moist woodland[1, 11]. Tolerates maritime exposure[200]. (Rather a strange report for a plant that needs to be grown in dense shade[K]) A very hardy plant, tolerating temperatures down to at least -15°C, but the young shoots in spring can be damaged by late frosts[11, 200]. It is therefore best not grown in a frost pocket[182]. This species used to be included in *O. horridus* as the Japanese form of that species, but it has recently (1991) been recognised as

a distinct species[200]. A very ornamental plant, but it is densely armed with spikes[60]. It transplants easily and also tolerates pruning[200]. The leaves and stems are excessively spiny[182].

### 6.2.332 *Dioscorea villosa*

Wild Yam

5 tlin 9 cyuc 2 kcaak 0 tcan 4 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Dioscorea villosa* is a PERENNIAL CLIMBER growing to 3 m (9ft 10in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta** Edible Parts: RootEdible Uses: Tuber - cooked[177]. Some caution should be exercised with this plant. See 'Medicinal Uses' for more information.

tcanta None known

dwatta Antiinflammatory Antirheumatic Antispasmodic Cholagogue Contraceptive Diaphoretic Homeopathy VasodilatorWild yam roots, and the roots of many other members of the genus, contains diosgenin[222]. This is widely used in modern medicine in order to manufacture progesterone and other steroid drugs. These are used as contraceptives and in the treatment of various disorders of the genitourinary organs as well as in a host of other diseases such as asthma and arthritis[222, 254]. The roots are anti-inflammatory, antispasmodic, cholagogue, diaphoretic and vasodilator[165, 238]. They are also a visceral relaxant[165]. This plant affords one of the best and fastest cures for bilious colic, it is especially helpful in treating the nausea of pregnant women[4] and has been used to ease the pain of childbirth[257]. It is also taken internally in the treatment of arthritis, irritable bowel syndrome, gastritis, gall bladder complaints, painful menstruation etc[238]. The root is harvested in the autumn and dried for later use[238]. The root should not be stored for longer than 1 year, since it is likely to lose its medicinal virtues[4]. Caution is advised in the use of this plant, when taken fresh it can cause vomiting and other side effects[222]. The root, harvested in September, is used to make a homeopathic remedy[232]. Its main use is in the treatment of infant colic[232].

propta Seed - sow March to April in a sunny position in a warm greenhouse and only just cover. It germinates in 1 - 3 weeks at 20°C[175]. Prick out the seedlings as soon as they are large enough to handle and grow on in a greenhouse for their first year. Plant out in late spring as the plant comes into new growth. Basal stem cuttings in the summer[37]. Division in the dormant season, never when in growth[1]. The plant will often produce a number of shoots, the top 5 - 10 cm of the root below each shoot can be potted up to form a new plant whilst the lower part of the root can possibly be eaten[K]. Tubercles (baby tubers) are formed in the leaf axils. These are harvested in late summer and early autumn when about the size of a pea and coming away easily from the plant. They should be potted up immediately in individual pots in a greenhouse or cold frame. Plant out in early summer when in active growth[K].

nwatta An easily grown plant, succeeding in a fertile well-drained soil in a sunny position or light shade[200]. Prefers a rich light soil[1]. Plants are hardy to at least -15°C[238]. Plants produce tubercles (small tubers that are formed in the leaf axils of the stems), and can be propagated by this means[K]. A climbing plant that supports itself by twining around the branches of other plants[219]. This is a highly polymorphic species, some botanists dividing it up into several species[235, 270]. Dioecious. Male and female plants must be grown if seed is required.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 6.2.299 *Oxalis magellanica*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Oxalis magellanica* is a PERENNIAL. See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta** Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[173, 177]. A pleasant acid flavour, but the leaves are rather small and they are also a bit chewy[K]. Use in moderation, see notes at top of sheet, Flowers - raw[K]. A pleasant and decorative addition to the salad bowl[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a sandy soil in a warm dry position in sun or light shade[1, 200]. Succeeds in the well-drained interstices of paving stones[200]. Plants can become a pest in the garden[200].

### 6.2.300 *Juglans microcarpa*

Texas Walnut, Little walnut, Stewart's little walnut  
5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta *Juglans microcarpa* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

**kcakta** Edible Parts: Oil SeedEdible Uses: OilSeed - raw. The seed is sweet and oily but it is rather small and has a thick shell[2, 62, 105, 183, 227]. The seed is the smallest of this genus[82]. An edible oil is obtained from the seed, it tends to go rancid quickly.

tcanta Herbicide Oil Rootstock WoodSometimes used as a rootstock[183]. Plants produce chemicals which can inhibit the growth of other plants. These chemicals are dis-

solved out of the leaves when it rains and are washed down to the ground below, reducing the growth of plants under the tree[18, 20, 159]. The roots of many members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. Wood - heavy, hard, not strong. It makes a beautiful veneer and has been very over-exploited in the wild for this purpose[82]. It is also used in cabinet making, furniture etc[82, 149].

dwatta None known

propta The seed is best sown as soon as it is ripe in individual deep pots in a cold frame[80]. You need to protect it from mice, birds, squirrels etc. The seed usually germinates in late winter or the spring. Plant out the seedlings into their permanent positions in early summer and give some protection from the cold for their first winter or two. The seed can also be stored in cool moist conditions (such as the salad compartment of a fridge) over the winter and sown in early spring but it may then require a period of cold stratification before it will germinate[78, 80, 113].

nwatta Requires a deep well-drained loam and a sunny position sheltered from strong winds[1, 11]. Prefers a slightly alkaline soil[200]. This species often experiences drought in its native range[229]. Plants produce a deep taproot and they are intolerant of root disturbance[1, 11]. Seedlings should be planted out into their permanent positions as soon as possible and given some protection for their first winter or two since they are somewhat tender when young[1, 11]. Flower initiation depends upon suitable conditions in the previous summer[200]. The flowers and young growths can be destroyed by even short periods down to -2°C, but fortunately plants are usually late coming into leaf[200]. Any pruning should only be carried out in late summer to early autumn or when the plant is fully dormant otherwise wounds will bleed profusely and this will severely weaken the tree[200]. Trees have a dense canopy which tends to reduce plant growth below them. We have no specific information for this species, but the roots of several members of this genus produce substances that are toxic to many plant species, especially apples (*Malus* species), members of the Ericaceae, *Potentilla* spp and the white pines (certain *Pinus* spp.)[200]. The leaves of many species also secrete substances that have an inhibitory effect on plants growing underneath them. All in all this is not a very good companion plant[K]. Closely related to *J. major*, and hybridizes with that species where their ranges overlap[229].

### 6.2.301 *Cornus macrophylla*

Large-Leaf Dogwood  
5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Cornus macrophylla* is a deciduous Tree growing to 15 m (49ft) by 10 m (32ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 105, 146, 158, 200, 218]. The fruit is about 6mm in diameter[200].

tcanta Charcoal WoodWood - hard, close grained, warps badly[158]. It makes a good charcoal[146, 158].

dwatta Anodyne Astringent Dysentery TonicAnodyne, astringent, tonic[178]. The wood is anodyne and a uterosedative[218]. The stem bark is used in the treatment of dysentery[218].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can

be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[1188]. A very ornamental tree[1]. There is some confusion between this species and *C. controversa*[11]. Plants usually fruit heavily in Britain[11]. The flowers have a soft sweet perfume[245]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.302 Crithum maritimum

Rock Samphire

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc htut cyutli kyuctcup hwicli hyhshras hpa7tli flatprikliwssliph-som hpa7tmwatli fyfxre7t hjonli

drutta Crithum maritimum is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves SeedpodEdible Uses: Leaves - raw or cooked[2, 4, 5, 7, 12, 27, 37]. Vaguely reminiscent of fennel, but the taste is more bitter and brackish[132]. A powerful salty flavour, it has been described by one person as tasting like 'a mixture of celery and kerosene'[238]. The leaves are used as a flavouring in salads etc[132]. Gathered in spring, the young leaves when sprinkled with salt and boiled make a very good pickle[4]. The leaves are rich in vitamin C[238]. Seed pods[4, 5, 7, 12]. They are used to make a warm aromatic pickle[2].

tcanta EssentialAn essential oil from the plant is used in perfumery[7].

dwatta Carminative Depurative Digestive Diuretic Vitamin CRock samphire is little used in herbal medicine, though it is a good diuretic and holds out potential as a treatment for obesity[254]. It has a high vitamin C and mineral content and is thought to relieve flatulence and to act as a digestive remedy[254]. The young growing tips are carminative, depurative, digestive and diuretic[7, 238]. They are gathered when in active growth in the spring and used fresh[7, 238]. The leaves have the reputation for helping people lose weight and so are used in treating cases of obesity as well kidney complaints and sluggishness[238]. The essential oil is a digestive, a few drops being sprinkled on the food[7].

propta Seed - best sown as soon as it is ripe in the autumn[1]. Sow in a cold frame and only just cover the seed[164]. Germination usually takes place within 3 - 6 weeks at 15°c[164]. One report says that the seed only has a short viability and should be sown as soon as it is ripe[238], but it has germinated well with us when sown in April in a cold frame[K]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. Division in spring[238].

nwatta Prefers a moist light sandy or gravelly soil, doing very well between stones or by a south-east facing wall[37]. Requires a warm dry well-drained sunny position and shade from the midday sun[1, 200]. Requires saline conditions[200]. Plants are best grown in moist salty soil or a very well-drained poor dry soil. When grown away from the coast, this plant requires a warm sheltered position and some protection in cold winters[238]. At one time this plant was sometimes cultivated in the vegetable garden[2], though it is quite difficult to do this successfully[1, 37]. It is difficult to grow outside its natural habitat[164].

### 6.2.303 Arum maculatum

Cuckoo Pint

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat m hkuc pcmhmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Arum maculatum is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Tuber - cooked and used as a vegetable[2, 177]. A mild flavour, the root contains about 25% starch[74]. A farina can be extracted from the root[2]. Roots can be harvested at any time of the year, though they are best when the plant is dormant[K]. At one time, the tubers of this plant were commonly harvested and used for food, but they are very rarely used nowadays[268, K]. The root must be thoroughly dried or cooked before being eaten, see the notes above on toxicity. Leaves - must be well cooked[177]. Available from late winter. Caution is advised, see the notes above on toxicity.

tcanta StarchStarch from the root has been used as a laundry starch for stiffening clothes[4, 66, 100]. Its use is said to be very harsh on the skin, producing sores and blisters on the hands of the laundresses who have to use it[66, 100], though another report says that the powdered root makes a good and innocent cosmetic that can be used to remove freckles[4].

dwatta Antirheumatic Diaphoretic Diuretic Expectorant Homeopathy Purgative VermifugeCuckoo pint has been little used in herbal medicine and is generally not recommended for internal use[268]. The shape of the flowering spadix has a distinct sexual symbolism and the plant did have a reputation as an aphrodisiac, though there is no evidence to support this[268]. The root is diaphoretic, diuretic, expectorant, strongly purgative and vermifuge[4, 9, 19, 21]. It should be harvested in the autumn or before the leaves are produced in the spring[4]. It can be stored fresh in a cellar in sand for up to a year or can be dried for later use[4]. The plant should be used with caution[9], see notes above on toxicity. The bruised fresh plant has been applied externally in the treatment of rheumatic pain[268]. A liquid from the boiled bark (of the stem?K) has been used in the treatment of diarrhoea[213]. A homeopathic remedy is prepared from the root and leaves[4]. It has been used in the treatment of sore throats[4, 268].

propta Seed - best sown in a greenhouse or cold frame as soon as it is ripe[134]. The seed usually germinates in 1 - 6 months at 15°c[134]. Stored seed should be sown in the spring in a greenhouse and can be slow to germinate, sometimes taking a year or more. A period of cold stratification might help to speed up the process. Sow the seed thinly, and allow the seedlings to grow on without disturbance for their first year, giving occasional liquid feeds to ensure that they do not become mineral deficient. When the plants are dormant in the autumn, divide up the small corms, planting 2 - 3 in each pot, and grow them on in light shade in the greenhouse for a further year, planting out when dormant in the autumn. Division of the corms in summer after flowering[200]. Larger corms can be planted out direct into their permanent positions, though it is best to pot up the smaller corms and grow them on for a year in a cold frame before planting them out.

nwatta Prefers a humus rich soil and abundant water in the growing season[1, 13]. Prefers a shady damp calcareous soil[13, 31]. Succeeds in sun or shade[90]. Plants are very shade tolerant[17] and grow well in woodland conditions[1]. The inflorescence has the remarkable ability to heat itself above the ambient air temperature to such a degree that it is quite noticeable to the touch[4]. Temperature rises of 11°c have been recorded[245]. At the same time, the flowers emit a foul and urinous smell in order to attract midges for pollination[245]. The smell disappears once the flower has been pollinated[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200]. Plant them out direct into their permanent positions.

nwatta Easily grown in a good well-drained loamy soil[1, 11, 200]. Succeeds in acid and calcareous soils[186]. Succeeds in sun or semi-shade[1, 11, 200], though it fruits less well in the shade[202]. Established plants are drought resistant[132]. Hardy to about -15°c[202]. This species has biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.327 Chimonobambusa quadrangularis

Square Bamboo

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Chimonobambusa quadrangularis is an evergreen Bamboo growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Young shoots - cooked. An excellent relish. The canes are up to 20mm in diameter[K].

tcanta Hedge Hedge Plant support WoodThe canes make good plant supports and are excellent material for handicrafts[195]. Can be grown as a hedge or screen[200].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings. Rhizome cuttings.

nwatta Prefers a good loamy soil. Succeeds in most soils so long as they do not dry out. Dislikes drought. Prefers a position sheltered from cold north and east winds. Plants are only reliably hardy in the mildest areas of Britain. Another report says that the plants are generally hardy, although severe winters may damage the leaves the plant itself can withstand temperatures down to about -15°c[200]. The square bamboo is cultivated for its edible stems in China and Japan. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The rootstock is running but it does not produce many new shoots and is not overly invasive[195]. The plant is rampant in its native range and other warm temperate areas, but it does not spread much in colder areas such as Britain[200]. The shoots are wide spaced and are produced from late May. Canes can be snapped off the plant. A plant at Trebah gardens in Cornwall had new shoots 3 metres long in mid-April 1995[K].

### 6.2.328 Forestiera neomexicana

Wild Olive

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Forestiera neomexicana is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen from July to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[105, 257]. Although only 4 - 8mm long[227], it has been suggested as a substitute for the true olive, *Olea europaea*[105, 177, 183].

tcanta MiscellanyPlants growing in the wild are used as indicators of underground water[257].

dwatta MiscellanyNone known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[11, 200]. Easy. Cuttings of mature wood, November to February in a frame or sheltered outdoor bed.

nwatta Succeeds in most soils[1, 11, 182]. Requires a sunny position and a well-drained soil[200]. Tolerates dry sites[200]. Flowers are produced in the axils of the previous years leaves[227]. Plants do not fruit well in Britain, probably due to a lack of sunshine[11].

### 6.2.329 Chrysolepis sempervirens

Dwarf Golden Chinquapin, Bush chinquapin

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Chrysolepis sempervirens is an evergreen Shrub growing to 3 m (9ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[257]. Very sweet and much appreciated, tasting somewhat like a hazel nut[183]. The small seed is up to 13mm wide[270].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe, the seed must be protected from mice etc[200]. The seed has a short viability and should not be allowed to dry out. If stored overwinter it should be kept cool and moist. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts, and consider giving them some protection from the cold for their first winter outdoors.

nwatta Requires a lime-free soil[1]. Prefers a sheltered semi-shaded position and a light deep moist soil[1, 11]. Plants can only be grown in oceanic and Mediterranean climates, better in Britain[200]. In N. America this plant grows thriving at low elevations than C. chrysophylla. A specimen at Edinburgh Botanical Gardens is 3.5 metres tall and 6 metres across[11]. A very ornamental shrub[183].

### 6.2.330 Calycanthus floridus glaucus

Eastern Sweetshrub

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Calycanthus floridus glaucus is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July,

hpa7tmwatli fyfxre7t hjonli

drutta Amelanchier ovalis integrifolia is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit, raw or cooked[74]. The fruit is rich in iron and copper[226].

tcanta None known
dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Often found on calcareous soils in the wild. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main draw-back to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. Considered to be part of *A. ovalis* by some botanists, whilst others give it specific status. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1].

### 6.2.324 Vaccinium oldhamii

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3.5 m hkuc
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli dyatxre7t hjonli

drutta Vaccinium oldhamii is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[1, 11, 105, 177]. The fruit is about 6mm in diameter[200].

tcanta None known
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that

spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Self-sterile, at least two plants from different sources must be grown if fruit is required. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.325 Rubus buergeri

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rubus buergeri is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is about 25mm in diameter[200]. tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Tip layering in July. Plant out in autumn. Division in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.326 Rubus species

Hybrid Berries

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc
hmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli frusflat-priklwisslip hpa7tmwatli fyfxre7t hjonli

drutta Rubus species is a deciduous Shrub growing to 3 m (9ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Fruit - raw or cooked[200].

tcanta None known

dwatta None known

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. This plant is a cultivar and will not breed true from seed. Cuttings of half-ripe wood, July/August in a

### 6.2.304 Quercus mongolica

Mongolian oak

5 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat m hkuc
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Quercus mongolica is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 3 and is not frost tender. It is in flower from May to June, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[63, 105]. The seed is about 2cm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Charcoal Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in good numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood. Used for construction and charcoal[46, 61].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The seed ripens in its first year[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 6.2.305 Lindera obtusiloba

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli nyanhjen hjonli

drutta Lindera obtusiloba is a deciduous Shrub growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from March to April. The species is dioecious (individual flowers are either male

or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: Oil TeaThe young buds and leaves are used as a tea substitute[177, 183]. Young leaves are fried and used as a Buddhist ceremonial dish[183].

tcanta OilAn oil obtained from the plant is used as a hair oil[151]. It is probably obtained from the oil[K].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse. The seed has a short viability and should not be allowed to dry out[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, July in a frame[200]. Layering.

nwatta Requires a lime-free rather moist soil[200]. Prefers partial shade or dappled sunlight in a fertile moisture-retentive soil enriched with leafmould[200]. Plants can be pruned right back to the base if required, though any drastic pruning is best spread over several seasons[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious, male and female plants must be grown if seed is required[188].

### 6.2.306 Pseudocyonia sinensis

Chinese Quince, Quince

5 tlin 8 cyuc 2 kcaak 0 tcan 1 dwat 6 m hkuc
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Pseudocyonia sinensis is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - eaten as a sweetmeat, candied, preserved in syrup or made into a liqueur[46, 183]. The juice can also be mixed with ginger and made into a beverage[183]. The fruit is very large, up to 18cm long[105, 179].

tcanta Pot-pourri WoodThe fruits are very aromatic and are placed in a bowl to impart a delightful spicy scent to a room[46]. Wood - hard, dark red. Used for picture frames[174].

dwatta AntitussiveThe fruit is antitussive[174, 279]. It contains several medically active constituents including organic acids plus the flavonoids rutin and quercetin[279]. It is used in Korea to treat asthma, the common cold, sore throats, mastitis and tuberculosis[279].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn[200]. Stored seed requires 3 months cold stratification and should be sown as early in the year as possible[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering.

nwatta Landscape Uses:Specimen. Requires a sunny position[1, 11], succeeding in any reasonably good soil that is well-drained but not dry[1, 200]. Trees are very hardy when grown in a continental climate with long hot summers but in the cooler climate of Britain where they do not always ripen their wood they are only reliably hardy to about -5°C[200]. They grow well on a south-facing wall[11, 200] and this is the only way to ensure that they fruit well in Britain[1]. A plant growing in a sunny position on the south side of tree cover at Kew was 3.5 metres tall in spring 1995 and looked healthy[K]. Occasionally cultivated, especially in China[46], for its edible fruit, there are some named varieties[183]. There is a disagreement over the correct name for this species, with

some authorities using *Pseudocycdonia sinensis*[11, 200] and others *Chaenomeles sinensis*[266]. Flowers are produced on year-old wood[200]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 6.2.307 *Fuchsia magellanica*

*Fuchsia*, Hardy *fuchsia*

5 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlnutyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Fuchsia magellanica* is a deciduous Shrub growing to 3.6 m (11ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. A juicy berry[K], it is not very palatable[105, 177].

tcanta Dye Hedge HedgeA black dye is obtained from the wood[46, 61]. Very resistant of maritime exposure and tolerant of trimming it makes a good informal hedge in mild maritime areas[29, 75, 166]. The variety 'Riccartonii' is commonly used[200]. The cultivar 'Prostrata' forms a carpet of growth and can be used as a ground cover when planted about 60cm apart each way[208].

dwatta Diuretic FebrifugeDiuretic, febrifuge[46].

propta Seed - best sown as soon as it is ripe[200] though it can also be sown in the spring[1]. Surface sow the seed in pots in a warm greenhouse and do not allow the compost to dry out[200]. Germination should take place in less than 6 weeks. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Inter-nodal cuttings of greenwood, 5 - 8cm long, May/June in a frame. Quick and easy, a high percentage take[78, K]. Overwinter in the greenhouse for the first year and plant out after the last expected frosts. Inter-nodal cuttings of half-ripe wood, July/August in a frame. Very quick and easy, treat as greenwood cuttings above[K]. Cuttings usually succeed at any time during the growing season[K].

nwatta Landscape Uses:Border, Container, Ground cover, Specimen. Succeeds in any fertile well-drained circum-neutral soil, preferring one that is rich in humus[1, 200]. Grows well in heavy clay soils. Prefers cool moist conditions and some shade[1, 15]. Succeeds in a good loam if leafmold and sand are added[1]. This species is very resistant to maritime exposure, it can be grown right on the coast[75, 166]. The top growth is hardy to about -10°c[184], this can be cut right back to the ground in severe winters but the plants usually recover well, growing away quickly in the late spring and flowering by late summer[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The sub-species *F. magellanica myrtifolia* often bears a very large crop of fruit[K]. The cultivar 'Riccartonii' can be hardy fairly well north in Britain. A lovely specimen 3 metres tall was seen growing in dappled shade of trees in the Monastery Gardens in York[K]. A very ornamental plant, it is a parent of most of the hardy ornamental *fuchsia* varieties[1]. Plants seem to be immune to the predations of rabbits[233]. Plants are pollinated by humming birds in the wild, they are good bee plants in Britain[108]. Special Features: Extended bloom season in Zones 9A and above, Blooms are very showy.

### 6.2.308 *Thamnocalamus spathiflorus*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc

hmimhtut cyutli tcup hwicli hrasjlnutyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Thamnocalamus spathiflorus* is an evergreen Bamboo growing to 6 m (19ft 8in). See above for USDA

hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Seed StemEdible Uses: Young shoots - cooked[177]. Seed - cooked and used as a cereal[177]. The plants only flower and produce seed at intervals of several years.

tcanta Basketry Hedge Plant supportA valuable plant for screen planting in wet areas[200]. The canes are used for making baskets and pipes[25, 46, 51, 195]. They can also be used as plant supports[146]. The canes are quite brittle and so are not very useful for weaving, in their native range they are only used when better species are not available[220].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings.

nwatta Succeeds in most soils in sun or shade so long as the soil is moist[200]. Prefers a good loamy soil in a semi-shaded position[1, 11, 25], the leaves curling up when the plant grows in strong sunlight. Dislikes drought[1]. Requires a position sheltered from cold winds[25, 195]. When grown outdoors, this species is only hardy in the milder areas of Britain[195]. Plants are hardy to about -20°C according to another report. This species is notably resistant to honey fungus[200]. A clump-forming species, it does not hinder the regeneration of tree growth in its native range and is also a very valuable species for providing food and shelter for wildlife[267]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The rootstock is caespitose[25]. Closely related to *T. aristatus*[200].

### 6.2.309 *Cakile maritima*

Sea Rocket, European searocket

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc htut cyutli tcup hwicli hyishras hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Cakile maritima* is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves Oil Root. Seedpod Uses: Condiment OilLeaves, stems, flower buds and immature seedpods - raw or cooked. They are rich in vitamin C but have a very bitter taste[4, 66]. Used mainly as a flavouring[132]. Very young leaves can be added to salads whilst older leaves can be mixed with milder tasting leaves and used as a potherb[183, K]. Root - dried and ground into a powder, then mixed with cereal flours and used to make bread[2]. A famine food, it is only used in times of scarcity[183]. The seed contains a fatty oil[74]. No more details are given.

individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in early summer. Cuttings of half-ripe wood, July/August in a frame. Root cuttings, 3cm long, planted horizontally in pots in a greenhouse. Good percentage[78]. Suckers, removed in late winter and planted into their permanent positions[113].

nwatta Uses: Clearstem tree, multi-stem tree, specimen tree, specimen shrub; Parks, tree containers, cemeteries, roof gardens, large gardens. Prefers a good deep well-drained moisture retentive soil in full sun or semi-shade[1, 11, 200]. Flowers are formed on the old wood[206]. Dioecious. Male and female plants must be grown if seed is required. Self-sown seedlings have occasionally been observed growing in bare soil in the shade of the parent plant[K].

### 6.2.321 *Celtis tenuifolia*

Small Hackberry, Dwarf hackberry

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 4.5 m hkuc htut cyutli hgatkycup hwicli hyishrasjlt hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Celtis tenuifolia* is a deciduous Tree growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. Sweet but thin fleshed[227]. The thin flesh has a sweet, mealy pleasant taste[K]. The fruit is small, up to 10mm in diameter, with a single large seed[82, K]. The trees often produce large crops of fruit in Britain, but there is so little that is edible on each fruit that it is scarcely worthwhile[K].

tcanta Wood - very tough, pliable, durable. Of no commercial value[229]. The flexible thin shoots are used as walking sticks, the wood is also an excellent fuel.

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. This species is very closely related to *C. occidentalis*, and it is considered to be no more than a sub-species by many authorities[200]. Trees can be very long-lived, perhaps surviving for 1000 years in the wild[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.322 *Pseudosasa japonica*

Metake - Bamboo

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 4.5 m hkuc pcmhmimhtut cyutli tcuphja7n hwicli hyishrasjlnutyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Pseudosasa japonica* is an evergreen Bamboo growing to 4.5 m (14ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year.

The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Seed StemEdible Uses: Young shoots - cooked[2, 105, 177]. Harvested in the late spring when about 8 - 10cm above ground level, cutting the stems 5cm or more below soil level. They have a rather bitter flavour[K]. Seed - used as a cereal[105]. Small quantities of seed are produced in many years but it is seldom viable.

tcanta Hedge Hedge Plant support Soil stabilization-Plants can be grown along the river edge to protect the banks from erosion[195]. Canes are fairly thin walled but make very good plant supports[25, 75, 195]. Smaller canes can be plaited together and used as screens or as lathes for walls and ceilings[195]. Tolerant of maritime exposure, it can be grown as a screen or windbreak hedge in very exposed positions[75, 166]. The culms make an excellent wind filter, slowing its speed without creating turbulence. The leaves may look somewhat tattered by the end of the winter but plants will soon produce new leaves[K].

dwatta Abortifacient Anthelmintic Antivinous Aphrodisiac Stimulant TonicAnthelmintic, antinivous, stimulant, tonic[178]. Used orally in Chinese medicine for asthma, coughs and gallbladder disorders. In India leaves are used for spasmodic disorders of the stomach and to arrest bleeding [301]. Leaves used as a aphrodisiac [301].

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°C. Stored seed is best sown as soon as it is obtained. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse until they are large enough to plant out, which might take a few years. Plants only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Very easy, single canes of the current years growth can be used. Pot them up in light shade in a greenhouse. Make sure the foliage is not allowed to dry out - misting 2 - 3 times a day for the first couple of weeks following division can be very helpful. Plant out in the summer once they are growing away strongly. Cane layering in May. Detach individual canes and lay them horizontally in trenches 15cm deep. New shoots should arise from each joint. Rhizome cuttings.

nwatta One of the easiest bamboos to grow in Britain, it prefers an open loam of fair quality and a position sheltered from cold drying winds[1, 11, 29] but it tolerates maritime exposure[75, 166]. Succeeds on peaty soils[11]. Succeeds in soils that are half earth and half stone[195]. Requires abundant moisture and plenty of organic matter in the soil[200]. Endures near-saturated soil conditions[200]. Dislikes drought[1]. A very ornamental plant[1], it is said to be the hardest bamboo[25], tolerating temperatures down to about -15°c[200]. Down to -24°c according to another report. In warmer parts of Britain plants can attain a height of 6 metres or more. The rootstock is running and very invasive[25]. It is fairly easy to control, however, if any new shoots that are not wanted are broken off whilst they are still small and brittle. New shoots appear from April[25]. This species is notably resistant to honey fungus[200]. Plants often flower lightly for a number of years without dying out though they seldom produce viable seed[122]. Occasionally the plants can produce an abundance of flowers and this severely weakens, though does not usually kill, the plants. They can take some years to recover. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. Many plants flowered heavily in the late 1980's and are only slowly recovering.

### 6.2.323 *Amelanchier ovalis integrifolia*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 4 m hkuc

hmimhtut cyutli tcup hwicli hrasjlnutyikfrip hpa7tli flatprik



sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.317 *Malus glabrata*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc  
hmmihmtut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Malus glabrata* is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Up to 3cm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It usually germinates in late winter. Stored seed requires stratification for 3 months at 1°C and should be sown in a cold frame as soon as it is received[200]. It might not germinate for 12 months or more. Prick out the seedlings into individual pots as soon as they are large enough to handle. If given a rich compost they usually grow away quickly and can be large enough to plant out in late summer, though consider giving them some protection from the cold in their first winter. Otherwise, keep them in pots in a cold frame and plant them out in late spring of the following year. Cuttings of mature wood, November in a frame[11].

nwatta An easily grown plant, it succeeds in most fertile soils, preferring a moisture retentive well-drained loamy soil[1, 200]. Grows well in heavy clay soils. Prefers a sunny position but succeeds in partial shade though it fruits less well in such a situation[1, 200]. The fruit is a good wildlife food source, especially for birds[200]. This species is closely related to *M. glaucescens*[200]. It hybridizes freely with other members of the genus[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.318 *Pyrocydonia danielii*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc  
hmmihmtut cyutli hgattcup hwicli hrasjlutnykfrip hpa7tli flatprikliw hpa7tmwatli dyatxre7t hjonli

drutta *Pyrocydonia danielii* is a deciduous Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. Fully ripe fruits are crisp and juicy and the flavour is rather pear-like, though of inferior quality to most pears[K].

tcanta None known  
dwatta None known

propta Seed. A bigeneric hybrid, it will not breed true from seed even if fertile seed is produced. If by chance you do obtain seed, then it is best sown in the autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of softwood in early summer, treated with rooting hormone and rooted in a closed case with bottom heat[200]. Grafting onto *Pyrus communis*.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does

not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200].

### 6.2.319 *Asparagus verticillatus*

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 4 m hkuc  
hmmihmtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Asparagus verticillatus* is a PERENNIAL growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Young shoots - cooked[2, 105, 177].

tcanta None known  
dwatta None known

propta Seed - pre-soak for 12 hours in warm water and then sow in spring or as soon as the seed is ripe in early autumn in a greenhouse. It usually germinates in 3 - 6 weeks at 25°C[134]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a sunny position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Division in early spring as the plant comes into growth.

nwatta Easily grown in any good garden soil[200]. Prefers a rich sandy loam[1]. Dormant plants are hardy to about -20°C[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.320 *Zanthoxylum schinifolium*

Peppertree

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 4 m hkuc  
hmmihmtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli dyat hjonli

drutta *Zanthoxylum schinifolium* is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen in October. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Condi- mentSeed - cooked. It is used as a condiment, a pepper substitute[151]. Young leaves[105]. No more details are given.

tcanta ParasiticideNone known

dwatta Anaesthetic Diuretic Parasiticide Stimulant Tonic VasodilatorThe pericarp is anaesthetic, diuretic, parasiticide and vasodilator[176]. It is used in the treatment of gastralgia and dyspepsia due to cold with vomiting, diarrhoea, abdominal pain, ascariasis and dermal diseases[176]. It has a local anaesthetic action and is parasiticide against the pork tapeworm (*Taenia solium*) [176]. The pericarp contains geraniol. In small doses this has a mild diuretic action, though large doses will inhibit the excretion of urine[176]. There is a persistent increase in peristalsis at low concentration, but inhibition at high concentration[176]. The resin contained in the bark, and especially in that of the roots, is powerfully stimulant and tonic[82].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Stored seed may require up to 3 months cold stratification, though scarification may also help[113]. Sow stored seed in a cold frame as early in the year as possible. Germination should take place in late spring, though it might take another 12 months. Prick out the seedlings into

tcanta OilNone known  
dwatta Vitamin CNone known  
propta Seed - sown late spring or early autumn in situ. Germination is usually rapid.

nwatta Prefers a light well-drained soil and a sunny position[1, 200]. Plants are easily grown in a garden situation and can self-sow if the ground is disturbed by hoeing etc[K]. This species is closely related to *C. edentula*, which is native to N. America[17]. The seed is often dispersed by floating in sea water[17].

### 6.2.310 *Amelanchier ovalis*

Snowy Mespilus, Dwarf Garden Serviceberry  
5 tlin 7 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc  
htut cyutli tcup hwicli hrasjlutnykfrip hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Amelanchier ovalis* is a deciduous Shrub growing to 5 m (16ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Edible fruit - raw or cooked. Not very palatable, but it can be used for preserves etc[183]. The fruit is rich in iron and copper[226].

tcanta WoodWood - fine grained, hard, very heavy, reddish. Used for small articles[74].

dwatta None known

propta Seed - it is best harvested 'green', when the seed is fully formed but before the seed coat has hardened, and then sown immediately in pots outdoors or in a cold frame. If stored seed is obtained early enough in the autumn, it can be given 4 weeks warm stratification before being left out in the winter and it should then germinate in the spring. Otherwise seed can be very slow to germinate, perhaps taking 18 months or more. When large enough to handle, prick the seedlings out into individual pots and grow them on in a sheltered outdoor position, planting them out once they are 20cm or more tall. If there is sufficient seed it is best to sow it thinly in an outdoor seedbed[78, 80]. Grow the seedlings on for two years in the seedbed before planting them out into their permanent positions during the winter. Layering in spring - takes 18 months[78]. Division of suckers in late winter. The suckers need to have been growing for 2 years before you dig them up, otherwise they will not have formed roots. They can be planted out straight into their permanent positions if required.

nwatta Prefers a rich loamy soil in a sunny position or semi-shade[1, 200] but thrives in any soil that is not too dry or water-logged[11]. Grows well in heavy clay soils. Fairly lime tolerant[200]. Hardy to about -20°C[184]. All members of this genus have edible fruits and, whilst this is dry and uninteresting in some species, in many others it is sweet and juicy. Many of the species have potential for use in the garden as edible ornamentals. The main drawback to this genus is that birds adore the fruit and will often completely strip a tree before it is fully ripe[K]. A very ornamental plant[74]. Hybridizes freely with other members of this genus[200]. Grafting onto seedlings of *A. lamarckii* or *Sorbus aucuparia* is sometimes practised in order to avoid the potential problem of hybridizing[1]. Special Features:Not North American native, Blooms are very showy.

### 6.2.311 *Quercus acutissima*

Sawthorn Oak

5 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 5 m hkuc  
hmmihmtut cyutli tcup hwicli jlutnykfrip hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Quercus acutissima* is a deciduous Tree growing to 5 m (16ft) by 15 m (49ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium

(loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: Seed - cooked[105, 177]. The seed is up to 25mm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. Young leaves - cooked. A famine food when all else fails[177]. The roasted seed is a coffee substitute.

tcanta Charcoal Dye Fodder Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A black dye is obtained from the seed cups[109]. Wood - used for boat building and construction[109]. The wood is also used for fuel and charcoal[11, 109].

dwatta Astringent DysenteryThe stem bark is used to clean foul sores[218]. The seeds are used in the treatment of diarrhoea, menorrhagia and gastrointestinal hypertrophy[218]. The cupule (seed cup) is astringent[218]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - quickly loses viability if allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed but must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Fodder: Mast Industrial Crop: Tannin Management: Standard Regional Crop Staple Crop: Balanced carbLandscape Uses:Aggressive surface roots possible, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. The seed ripens in its second year[200]. This species is closely related to *Q. variabilis*[1]. Often cultivated in China as a coppiced tree for fuel and charcoal[109]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 8 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit

and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

### 6.2.312 Viburnum erubescens gracilipes

5 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Viburnum erubescens gracilipes is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A sweet flavour but there is very little flesh in relation to the size of the single large seed[K].

tcanta WoodWood - soft to hard, close and even grained. The wood is hardest in the cooler parts of its range, the Himalayan form is a possible Boxwood (Buxus spp) substitute[146].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Not all forms of this species are hardy in Britain[11]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. A polymorphic species[11]. This form of *V. erubescens* fruits freely in Britain[200].

### 6.2.313 Aesculus pavia

Red Buckeye

5 tlin 9 cyuc 2 kcaok 0 tcan 1 dwat 5 m hkuc pcmhmmhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aesculus pavia is a deciduous Shrub growing to 5 m (16ft) by 3 m (9ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be dried and ground into a powder and used as a gruel. The seed is quite large, about 25mm in diameter[27], and is easily harvested. Unfortunately, the seed is also rich in saponins and these need to be removed before it can be eaten. See also the notes above on toxicity. The following notes apply to *A. californica*, but are probably also relevant here:- The seed needs to be leached of toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213]. Most of the minerals etc would also have been leached out by this treatment[K].

tcanta Soap WoodSaponins in the seed and roots are a soap substitute[149, 169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K].

dwatta Cancer Hypnotic Odontalgic SalveThe powdered bark is hypnotic and odontalgic. It is used in the treatment of ulcers[149, 192, 227]. A poultice of the powdered seeds has been used in the treatment of cancer tumours and infections, and as a salve for sores[257]. An infusion of the roots has been used as a bath in the treatment of dyspepsia[257].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer. Division of suckers in the dormant season[200]. The suckers can be planted out straight into their permanent positions if required.

nwatta Landscape Uses:Specimen, Street tree, Woodland garden. Prefers a deep loamy well-drained soil but is not too fussy[1, 11]. Very shade tolerant, it also succeeds in a sunny position[200]. A very ornamental shrub, when dormant it is hardy to about -15°C[184] though the young growth in spring can be damaged by late frosts. It prefers a continental climate, growing best in eastern and south-eastern England[200]. Trees are fast-growing in the wild, though they are also short-lived[229]. They can commence flowering when only 1 metre tall[229]. Plants spread by means of suckers[200]. There are a number of named varieties, developed for their ornamental value. Var. 'Humilis' is a low growing form[182]. Most members of this genus transplant easily, even when fairly large[11]. Special Features: Attractive foliage, North American native, All or parts of this plant are poisonous, Attracts butterflies, Blooms are very showy.

### 6.2.314 Viburnum erubescens

5 tlin 9 cyuc 2 kcaok 0 tcan 1 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Viburnum erubescens is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[272]. A sweet flavour but there is very little flesh in relation to the size of the single large seed[K].

tcanta Miscellany WoodWood - soft to hard, close and even grained. The wood is hardest in the cooler parts of its range, the Himalayan form is a possible Boxwood (Buxus spp) substitute[146].

dwatta MiscellanyThe juice of the roots is used in the treatment of coughs[272].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully

developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Not all forms of this species are hardy in Britain[11]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. The flowers are deliciously scented[245]. A polymorphic species[11]. The sub-species *V. erubescens gracilipes*. Rehd. fruits freely in Britain[11].

### 6.2.315 Prunus emarginata

Bitter Cherry

5 tlin 9 cyuc 2 kcaok 0 tcan 2 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Prunus emarginata is a deciduous Tree growing to 5 m (16ft 5in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[229]. Intensely bitter[1, 11, 82, 99]. Some native North American Indian tribes saw the fruit as a great delicacy and an important food source, though others only ate it occasionally because of its bitter taste[257]. The fruit is 8 - 15mm in diameter with a thick flesh, and contains one large seed[229]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Basketry Dye Fuel Plaster String WoodA green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. The bark is used to ornament baskets and is also split into strips and used for making baskets that are watertight and resist decay[99, 257]. The bark is both strong and flexible as well as being ornamental[257]. The thin outer bark can be peeled off the tree in the same way as birch trees[226]. It has been used to make baskets, mats, ropes and as an ornament on bows, arrows etc[226, 257]. The bark can also be made into a string[257]. Wood - close-grained, soft, brittle[82]. It is sometimes used for furniture because it takes a high polish[229]. An excellent fuel[99].

dwatta Blood purifier Cardiac Contraceptive Eczema Laxative Plaster TB TonicBitter cherry was employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. The bark is blood purifier, cardiac, laxative and tonic[257]. An infusion of the bark has been used in the treatment of tuberculosis and eczema[257]. A decoction of the root and inner bark has been taken daily as a treatment for heart troubles[257]. An infusion of the

bark, combined with crab apple bark (*Malus* spp) has been used as a cure-all tonic in treating colds and various other ailments[257]. The bark, stuck on with resin, has been used as a dressing for wounds, swellings etc[226, 257]. An infusion of the rotten wood has been used as a contraceptive[257]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

nwatta Thrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. This species is unable to tolerate much shade competition from other trees[229]. A fast-growing but short-lived species in the wild[229]. The flowers diffuse a soft honey scent[245]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.316 Vitis arizonica

Canyon Grape

5 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis arizonica is a deciduous Climber growing to 5 m (16ft 5in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

ckakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[161, 177, 257]. The fruit is fairly small, but it is quite luscious[2]. The fruit is about 10mm in diameter[200] and is borne in bunches. Leaves - raw. Chewed to allay thirst. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 177]. Used as a vegetable in soups[183]. There is a distinctive bitterness in the flavour[K].

tcanta Plants can be used for ground cover[190]. They are best spaced about 30cm apart each way[208].

dwatta None known

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta An easily grown plant, it succeeds in most soils[188] but prefers a fertile well-drained soil[200]. Dislikes lime[50]. Shade tolerant[83], though it prefers a sunny position[K]. Established plants are drought tolerant[190]. Hardy to at least -15°c[200]. Spreads rapidly at the roots, but it is easily controlled[83]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

### 6.2.564 Hydrocotyle vulgaris

Pennywort

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli frusflatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Hydrocotyle vulgaris is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. A strong carroty taste[183], they cannot be eaten in quantity[144].

tcanta None known

dwatta None known

propta Seed - we have no information on this species but suggest sowing it in early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it would probably be worthwhile sowing the seed outdoors in situ in the spring. Division of rooted runners. Probably best done in spring but can be done at any time in the growing season if the plants are kept moist.

nwatta Requires a permanently moist position in sun or light shade[200]. Plants can be very invasive, though they are fairly easy to control by pulling out the rooted stems[200].

### 6.2.565 Plantago asiatica

Che Qian Zi

5 tlin 9 cyuc 1 kcaak 2 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Plantago asiatica is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can

grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked[218]. Rather fibrous, unless they are very young, they have a slightly bitter flavour[K].

tcanta Dynamic accumulator.

dwatta Antibacterial Antiinflammatory Antiseptic Antitussive Cardiac Diuretic Expectorant Haemostatic LaxativeThe leaves and the seed are anti-inflammatory, antiseptic, antitussive, cardiac, diuretic, expectorant, haemostatic. Assists the repair of joints[174, 176, 238]. The seed is used internally in the treatment of a variety of ailments including asthma, bladder problems, bronchitis, fever, hypertension and rheumatism[218, 238, 279]. The leaves are also used for these purposes, though they are considered to be less powerful than the seed[218]. The leaves can be harvested at any time in the growing season, and are used fresh or dried[238]. A decoction of the roots is used in the treatment of coughs[218]. Plantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238]. Extracts of the plant have antibacterial activity[218].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200]. This species is hardy to at least -15°c[238]. Closely related to P. major and included as a sub-species of that plant by some botanists[238].

### 6.2.566 Tricyrtis hirta

Toad Lily, Japanese Toad Lily

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Tricyrtis hirta is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - cooked.

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires 12 weeks stratification at 5°c[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division just before growth starts in spring to single crowns[175]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Border, Container, Rock garden, Woodland garden. Prefers a humus-rich fertile well-drained but moisture-retentive acid or neutral light sandy loam in partial shade[175, 200]. Prefers the dappled shade of a woodland garden but tolerates full sun if the soil is reliably moist throughout the growing season, flowering earlier in such a position[200]. Plants also require a sunnier position in the northern parts of Britain[233]. This species is hardy to about -20°c, but if prolonged cold weather is not accompanied by snow cover the plants will appreciate a good mulch of organic matter[187]. Plants are very susceptible to attacks by slugs[175]. Special Features:Attractive foliage, Suitable for cut flowers.

drutta Vaccinium japonicum is a deciduous Shrub growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. An acid flavour[105, 177]. The fruit is about 6mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.398 Cakile edentula

Sea Rocket, American searocket, Harper's searocket

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hyishras hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Cakile edentula is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Leaves Root StemEdible Uses: Leaves and young stems - raw or cooked[61, 172, 177]. The younger leaves are used in salads whilst older leaves are mixed with milder tasting leaves and used as a potherb[183]. A horseradish flavour[43]. Root - dried and ground into a powder; then mixed with cereal flours and used to make bread[61, 161, 172, 183]. A famine food, only used when all else fails[207].

tcanta None known

dwatta None known

propta Seed - sow late spring or early autumn in situ. Germination is usually rapid.

nwatta Prefers a light well-drained soil and a sunny position[1, 200]. This species is closely related to C. maritima[50].

### 6.2.399 Callirhoe leiocarpa

Tall Poppy-Mallow

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli kyuctcup hwicli hras hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Callirhoe leiocarpa is a ANNUAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone

6. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[2, 22, 46, 61, 105]. Parsnip-shaped[161].

tcanta None known

dwatta None known

propta Seed - sow outdoors or in a cold frame. Plants resent root disturbance so the seed is best sown in situ in April[138], though the slugs will have a field day if you do not protect the plants[K]. If seed is in short supply then sow it in pots in a cold frame, putting a few seeds in each pot, and plant the pots out in early summer once the plants have put on at least 15cm of growth. Germination usually takes place within 1 - 6 months at 15°c[138].

nwatta Prefers a light rich sandy loam and a sunny position[1]. This species is hardy to about -15°c[200]. A polymorphic species[1]. Plants resent root disturbance and should be planted into their final positions as soon as possible[138]. Slugs are strongly attracted to this plant and can destroy even established plants by eating out all the young shoots in spring[K].

### 6.2.400 Gaylussacia brachycera

Box Huckleberry

5 tlin 9 cyuc 2 kcaak 2 tcan 0 dwat 0.5 m hkuc pcmhmmhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaylussacia brachycera is an evergreen Shrub growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 62]. Not really regarded[183]. Tasteless[177, 200]. The fruit is about 12mm in diameter[200].

tcanta A good ground cover plant[200]. Spreading quite freely, it should be spaced about 30cm apart each way[208].

dwatta None known

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 1 month warm stratification followed by 2 months cold[113]. When large enough to handle, prick the seedlings out into individual pots of lime-free compost and grow them on in light shade in a greenhouse or cold frame for at least their first winter. Plant out into their permanent positions in late spring or early summer when they are at least 15cm tall. Cuttings of half-ripe wood, July/August in a frame[200]. Layering. Division in spring.

nwatta Requires a lime-free moist peaty soil, thriving in sun or part shade[182, 200]. Prefers a position in partial or full shade[208]. Plants are hardy to about -15°c[200]. This species rarely sets viable seed[200]. There is a colony in New Jersey that covers 3.8 hectares of land, it is estimated to be 10,000 years old and to have originated vegetatively from one single mother plant[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2].

### 6.2.401 Potentilla nepalensis

Nepal Cinquefoil, Cinquefoil

5 tlin 10 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Potentilla nepalensis is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is

hermaphrodite (has both male and female organs) and is pollinated by insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. Starchy[177].

tcanta None known

dwatta DepurativeThe root is depurative[240]. The ashes are mixed with oil and applied to burns[240].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Alpine garden, Border, Container, Ground cover, Rock garden, Specimen. A very tolerant and easily grown plant, surviving considerable neglect[K]. It grows best in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. There are many named forms selected for their ornamental value[187]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Suitable for cut flowers.

## 6.2.402 Sinapis arvensis

Charlock, Charlock mustard, Wild mustard
5 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.8 m hkuc htut cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikwlisslip hpa7tmwatli xre7t hjonli

drutta Sinapis arvensis is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Oil Oil SeedEdible Uses: Condiment Oil OilLeaves - raw or cooked[2, 4, 5, 12, 74]. Somewhat hot, the young leaves are used as a flavouring in salads, where they add a piquant flavour[9, 183]. Older leaves are used as a potherb[183]. It is best to use just the young shoots and leaves in the spring, older leaves are bitter[9]. Flowering stems - cooked[9, 74]. A pleasant, cabbage/radish flavour, they can be used as a broccoli substitute before the flowers open[183]. The stems should be lightly steamed for no more than 5 minutes[9]. The flowers can also be cooked as a vegetable or used as a garnish[183]. Seed - it can be sprouted and eaten raw[12]. A hot flavour, it can be added to salads and sandwiches[183]. The seed can be ground into a powder and used as a food flavouring. It has a hot mustard flavour[4, 9, 46, 115]. An edible oil is obtained from the seed[1, 57, 74].

tcanta Oil OilAn edible semi-drying oil is obtained from the seed. It is also used in making soap[74] and burns well so can be used for lighting[4].

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Black depression', 'Melancholia' and 'Gloom'[209].

propta Seed - germinates in spring and autumn in the wild. It should not really need much encouragement.

nwatta Usually found on heavy alkaline soils in the wild[17]. Succeeds on moist soils. Dislikes shade. The plant harbours an eelworm that attacks other crops[13]. It is therefore best not to grow it in a garden setting.

## 6.2.403 Asarum shuttleworthii

Asarabacca, Mottled Wild Ginger
5 tin 9 cyuc 2 kcaak 2 tcan 0 dwat 0.1 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Asarum shuttleworthii is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe following note is for the related A. caudatum, it quite possibly also applies to this species[K]. The root can be used as a ginger substitute[183]. The root has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic[245]. It can be harvested all year round, but is best in the autumn[K]. It can also be dried for later use[K]. Leaves are a tea substitute[177, 183].

tcanta A useful ground-cover plant for shady positions so long as the soil is not dry[197], spreading by its roots[208].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Landscape Uses:Border, Ground cover, Rock garden, Woodland garden. Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are hardy to at least -15°C[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200]. Special Features:Attractive foliage, North American native, Fragrant foliage, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.404 Duchesnea indica

Mock Strawberry, Indian strawberry
5 tin 11 cyuc 2 kcaak 3 tcan 2 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Duchesnea indica is an evergreen Perennial growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from May to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Hydrocotyle sibthorpioides is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to September, and the seeds ripen from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: The whole plant is eaten raw or cooked as a potherb[61, 105, 183]. It has a parsley-like aroma[183].

tcanta None known

dwatta Depurative FebrifugeDepurative, febrifuge. Resolves mucus formation[147]. The juice of the plant is used in the treatment of fevers[272]. A paste made from the plant is applied externally to wounds and boils[272]. The plant is decocted and used in the treatment of abscesses, boils, bruises, cirrhosis, colds, coughs, hepatitis, hepatoma, influenza, itcha, jaundice, sinusitis and sore throat[218]. It is a Chinese herbal drug for hepatoma[218].

propta Seed - we have no information on this species but suggest sowing it in early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of rooted runners. Probably best done in spring but can be done at any time in the growing season if the plants are kept moist.

drutta Requires a permanently moist position in sun or light shade[200]. Plants are occasionally found as weeds in damp lawns[1].

## 6.2.560 Cochlearia danica

Danish Scurvy Grass
5 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.2 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli priklwshsom hpa7tmwatli fyifxre7t hjonli

drutta Cochlearia danica is a ANNUAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[100, 105, 177]. Used as a flavouring in salads, it is considered to be superior to C. officinalis[183]. The leaves are rich in vitamin C[100], though very few people will actually enjoy the pungent flavour[K].

tcanta None known

dwatta Antiscorbatic Vitamin CThe leaves are a rich source of vitamin C and are used as an antiscorbatic[100].

propta Seed - sow spring or autumn in situ. Germination usually takes place within 2 - 3 weeks at 15°C[164].

nwatta Prefers a damp well-drained soil. Avoids acid soils in the wild. Prefers a sandy or gritty well-drained soil[200]. Hybridizes with C. officinalis[17].

## 6.2.561 Asplenium trichomanes

Maidenhair Spleenwort, Dense spleenwort, Toothed spleenwort, Brightgreen spleenwort

5 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.4 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Asplenium trichomanes is an evergreen Fern growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, and the seeds ripen from May to October. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It

can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe dried fronds have been used as a tea substitute[4].

tcanta None known

dwatta Demulcent Emmenagogue Expectorant LaxativeA tea made from the fronds is sweet, demulcent, expectorant and laxative[4, 240]. It has been used in the treatment of chest complaints[4] and to promote menstruation[257].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. The spores usually germinate in the spring[1]. Spring sown spores germinate in 1 - 3 months at 15°C[134]. Pot on small clumps of plantlets as soon as they are large enough to handle and grow them on in light shade in a greenhouse. Keep the plants humid until they are well established. Once the plants are 15cm or more tall, plant them out into their permanent positions in the spring.

nwatta Requires a well-drained position and lots of old mortar rubble in the soil[1]. Requires a humid atmosphere and some shade[28, 31]. A good plant for growing on a shady part of an old dry-stone or brick wall[K]. Plants are hardy to about -30°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.562 Calystegia soldanella

Sea Bindweed, Seashore false bindweed
5 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Calystegia soldanella is a PERENNIAL CLIMBER growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked as a vegetable or pickled and used as a samphire substitute[2, 105]. Caution is advised since the plant might have a purgative effect[173].

tcanta StringThe stems are very flexible and are used as a string for tying[66]. Fairly strong but not long-lasting[K].

dwatta Antiscorbatic Diuretic Febrifuge Irritant Purgative VermifugeAntiscorbatic, diuretic, febrifuge, irritant, purgative and vermifuge[218].

propta Seed - sow spring in a cold frame in a free draining compost and only just cover. The seed usually germinates in 1 - 3 months at 15°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring whilst dormant[200].

nwatta Easily grown in ordinary well-drained garden soil in a sunny position[1, 200]. This species is very difficult to establish successfully in the garden[1].

## 6.2.563 Sedum anacampseros

Loce Restorer
5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta Sedum anacampseros is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

drutta Spiraea pyramidata is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made by boiling the stems, leaves and flowers[161, 183, 257].

tcanta None known

dwatta TonicA decoction of the plant has been drunk as a tonic[257].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta An easily grown plant, it tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. This species is probably a natural hybrid, *S. betulifolia* x *S. douglasii* menziesii[11, 204]. It hybridizes freely with other members of this genus[11].

### 6.2.557 Eremurus stenophyllus aurantiacus

Foxtail Lily

5 tlin 10 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc htut cyuthi hgatkuyctcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Eremurus stenophyllus aurantiacus is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. Sow stored seed in a greenhouse as soon as it is obtained. Germination is slow and could take 1 - 12 months at 15°C. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow on for their first winter in a greenhouse. Plant out into their permanent positions in late spring after the last expected frosts. Do not plant deeply in the soil, the crown of the plant should be slightly exposed[245]. Division after the plant dies down in late summer. Great care must be taken because the plants resent root disturbance[200]. Only divide the plants when it is really necessary, and no more frequently than once every 6 years, being careful not to break the brittle roots[245]. It is probably best to pot up the divisions and grow them on in the greenhouse until they are established.

nwatta Landscape Uses:Border, Seashore, Specimen. Prefers a very well drained, very rich, light sandy loam in a warm sunny sheltered position[90, 200]. A covering of sharp sand helps the plant to survive wet winters[90]. Plants can also be mulched overwinter with organic matter in the autumn in order to give them extra protection, but this mulch must be removed in the spring otherwise it might encourage the new growth to rot[200]. Some protection should be given to the young shoots in spring in areas subject to late frosts[200]. Keep plants dry in summer after they have flowered[90]. A very ornamental plant[233], it is said to be an im-

portant food source in Afghanistan[177]. Plants resent root disturbance and so should be placed in their final positions as soon as possible[200]. Plants require some cold stratification in winter in order to flower well in the following summer[200]. Slugs are very attracted to this plant so some protection must be given[90]. Special Features: Suitable for cut flowers, Attractive flowers or blooms.

## 6.2.558 Iris cristata

Crested Iris, Dwarf crested iris
5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 0.2 m hkuc hmimhtut cyuthi tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta Iris cristata is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in) at a medium rate. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - used as a spice[2, 105]. Frequently chewed by local people to alleviate thirst[177, 207]. When first chewed the roots have a pleasant sweet taste, within a few minutes this changes to a burning sensation far more pungent than capsicums[207]. Caution is advised, see the notes above on toxicity.

tcanta None known

dwatta Hepatic PoultriceAn ointment made from the roots is applied to cancerous ulcers[222, 257]. A tea made from the roots is used in the treatment of hepatitis[222, 257].

propta Seed - best sown as soon as it is ripe in a cold frame. It does not require cold stratification. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division in July/August[42]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Alpine garden, Container, Ground cover, Massing, Rock garden, Woodland garden. Requires a light or gravelly[42] lime-free[79] soil of a woodland nature in partial shade[42, 79, 127] or full sun[42]. Likes plenty of moisture in summer but the soil must be well-drained[127]. Grows well on a peat bank[188]. Plants are hardy to about -20°C[187]. Another report says that it is best if the plants are lifted intact in October, stored in sand and planted out in March[1]. Members of this genus are rarely if ever troubled by browsing deer and rabbits[233]. Plants require protection from slugs[187]. Frequent division and transplanting every other year is necessary if the plant is to thrive and persist[187]. Special Features:North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers. The plant is heat tolerant in zones 10 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 6.2.559 Hydrocotyle sibthorpioides

Water Pennywort, Lawn marshpennywort

5 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 0.1 m hkuc

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw[105, 177]. Dry and insipid[17]. Certainly rather tasteless, but it is not dry[K]. A flavour somewhat like a water melon according to some people, but this is possibly the product of a strained imagination[K].The fruit contains about 3.4% sugar, 1.5% protein, 1.6% ash[194]. Vitamin C is 6.3mg per 100ml of juice[194]. The fruit is about 10mm in diameter with the appearance and texture of a strawberry but very little flavour[K]. A clump 2.5m<sup>2</sup> yields about 150g of fruit annually[194]. Leaves - cooked[179].

tcanta A good ground cover plant, spreading quickly[197] by means of runners[214]. It is rather bare in winter though[K] and should not be grown with small plants since it will drop them out[208]. A good cover for bulbous plants[214]. Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wildfires, theses are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level groundcovers provide little fuel.

dwatta Anticoagulant Antiphlogistic Antiseptic Depurative Eczema Febriifuge Poultrice Skin Vitamin CThe whole plant is anticoagulant, antiseptic, depurative and febrifuge[147, 178]. It can be used in decoction or the fresh leaves can be crushed and applied externally as a poultice[147]. It is used in the treatment of boils and abscesses, weeping eczema, ringworm, stomatitis, laryngitis, acute tonsillitis, snake and insect bites and traumatic injuries[147]. A decoction of the leaves is used in the treatment of swellings[147, 178, 218]. An infusion of the flowers is used to activate the blood circulation[218]. The fruit is used to cure skin diseases[218]. A decoction of the plant is used as a poultice for abscesses, boils, burns etc[218].

propta Seed - sow spring in a sunny position in a greenhouse. Germination usually takes place within 1 - 6 weeks or more at 15°C. A period of cold stratification may speed up germination. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division of runners in spring or late summer. Very easy, they can be planted out straight into their permanent positions.

nwatta Prefers a moist but well-drained soil in a sunny position[175]. Plants are at their best in semi-shade, though they are not too fussy[214] and can succeed in quite dense shade[208, 214]. They also grow well in a rock garden[1]. Plants are hardy to about -20°C[200]. A very ornamental plant[1] but it can be invasive, spreading freely by means of runners[187]. Plants are more or less evergreen, though they can be browned by severe frosts[214]. Plants sometimes self-sow in British gardens[214]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from runners away from the plant [2-1]. Heat Zone: 8-6.

## 6.2.405 Calendula arvensis

Field Marigold

5 tlin 9 cyuc 2 kcak 0 tcan 3 dwat 0.3 m hkuc htut cyuthi tcup hwicli hyishrasjlutnyik hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Calendula arvensis is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to November, and the seeds ripen from August to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young shoots and leaves - raw or cooked[105, 177, 183, 217]. The leaves are very rich in vitamins and minerals, they are similar to Taraxacum officinale (Dandelion) in nutritional value[179]. Flower heads - pickled[177, 183].

tcanta None known

dwatta Antiphlogistic Antiseptic Antispasmodic Aperient Astringent Cholagogue Diaphoretic Emmenagogue

Homeopathy Skin Stimulant Vulnerary WartsThe leaves are diaphoretic[61, 240]. The flowers are said to be antispasmodic, emmenagogue and stimulant[240]. The plant seems to have similar therapeutic properties to pot marigold, *C. officinalis*[254]. These properties are:- Pot marigold is one of the best known and versatile herbs in Western herbal medicine and is also a popular domestic remedy[4, 254]. It is, above all, a remedy for skin problems and is applied externally to bites and stings, sprains, wounds, sore eyes, varicose veins etc[4, 254]. It is also a cleansing and detoxifying herb and is taken internally in treating fevers and chronic infections[4, 254]. Only the common deep-orange flowered variety is considered to be of medicinal value[4]. The whole plant, but especially the flowers and the leaves, is antiphlogistic, antiseptic, antispasmodic, aperient, astringent, cholagogue, diaphoretic, emmenagogue, skin, stimulant and vulnerary[4, 7, 9, 21, 46, 165, 201]. The leaves can be used fresh or dried, they are best harvested in the morning of a fine sunny day just after the dew has dried from them[4]. The flowers are also used fresh or dried, for drying they are harvested when fully open and need to be dried quickly in the shade[4]. A tea of the petals tones up the circulation and, taken regularly, can ease varicose veins[201]. An application of the crushed stems to corns and warts will soon render them easily removable[7]. The leaves, blossoms and buds are used to make a homeopathic remedy[232]. It is used internally in order to speed the healing of wounds[232].

propta Seed - sow in situ from spring to early summer and again in September. The seed germinates best in darkness and usually within 1 - 2 weeks at 21°C[138].

nwatta An easily grown and very ornamental plant, it succeeds in any well-drained soil[200], though it prefers a good loam and does best in a sunny or at least partially sunny position[4, 15, 200]. The plant flowers best when it is grown in a poor soil. Plants usually self-sow quite freely in the garden.

## 6.2.406 Hyssopus officinalis

Hyssop

5 tlin 10 cyuc 2 kcak 5 tcan 3 dwat 0.6 m hkuc

htut cyuthi kuyctcup hwicli hrasjlut hpa7tli prikklwis hpa7tmwatli fyifxre7t hjonli

drutta Hyssopus officinalis is an evergreen Shrub growing to 0.6 m (2ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil ShootsEdible Uses: Condiment OilLeaves and young shoot tips - raw or used as a flavouring in soups, salads etc[4, 14, 183]. A strongly aromatic flavour, somewhat like a cross between sage and mint, it has fallen out of favour in recent years[4, 238]. It can be used fresh or dried[21]. Flowers - raw. Added to salads[183]. An essential oil from the plant is used as a food flavouring[183].

tcanta Essential Fungicide Hedge Hedge Oil Pot-pourri Repellent StrewingHyssop can be grown as a dwarf hedge, it responds well to trimming in the spring[14, 52, 182]. The growing plant attracts cabbage white butterflies away from brassicas[14, 18, 20]. Another report says that hyssop attracts cabbage white butterflies and should not be grown near cabbages[201]. An essential oil from the leaves is antiseptic and also used in perfumery and as a food flavouring[200, 201]. It has a particularly fine odour and is much valued by perfumers[4]. Average yields of the oil are about 0.6%[7]. Yields from the blue-flowered variety are 1 - 1.5% essential oil, the red-flowered variety yields about 0.8%, whilst the white-flowered form yields 0.5% essential oil[240]. The plant was formerly used as a strewing herb[4, 200] and is also used in pot-pourri[245]. A tea made from the leaves is useful for controlling bacterial plant diseases[201]. Plants can be grown for ground cover when spaced about 45cm apart each way[208].

dwatta Antiseptic Aromatherapy Astringent Carminative Diaphoretic Emmenagogue Expectorant Pectoral Stimulant Stomachic Tonic VasodilatorHyssop has a long history of medicinal use and was so highly esteemed in the past that it was considered to be a virtual cure-all[254]. Currently an undervalued herb, it is often used as a household remedy, particularly as an expectorant and stomach tonic[4, 254]. It has a positive effect when used to treat bronchitis and respiratory infections, especially where there is excessive mucous production[254]. Hyssop can irritate the mucous membranes, so it is best given after an infection has peaked, when the herb's tonic action encourages a general recovery[254]. The plant should not be used by pregnant women, however, since in large quantities it can induce a miscarriage[7]. The leaves and flowering tops are antiseptic, antitussive, astringent, carminative, diaphoretic, emmenagogue, expectorant, pectoral, sedative, stimulant, stomachic, tonic and vasodilator[4, 7, 9, 21, 165, 238]. The plant can be harvested when in full flower and dried for later use[4]. A tea made from the leaves is used in the treatment of flatulence, stomach-aches, upper respiratory tract infections, coughs in children etc[222, 238]. A poultice made from the fresh herb is used to heal wounds[4, 238]. The essential oil is used in aromatherapy. Its keywords is 'Stability'[210]. This oil should not be used on people who are highly strung as it can cause epileptic symptoms[7, 254]. The essential oil should not be used internally except under professional supervision[254].

propta Seed - sow spring in a cold frame and only just cover the seed. Very easy, the seed germinates quickly. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 7 cm with a heel, June/July in a frame[11, 78]. Fairly easy, the cuttings root quite quickly. Grow on the plants in the greenhouse for their first winter and plant out in late spring. Cuttings of greenwood, 5 - 7 cm with a heel, April/May in a frame[1]. Plant out in the summer. Division in spring or autumn[1, 4].

nwatta Landscape Uses:Border, Specimen. Prefers a light, dry calcareous soil and a sunny position[1, 14, 37, 52]. A very cold-hardy plant, when dormant it can tolerate temperatures down to about -25°C[187]. Hyssop has very aromatic leaves and is commonly grown in the herb garden where it makes a good edging plant to a border[4]. There are some named varieties[183]. The plant needs to be trimmed regularly to keep it in shape, untrimmed plants will soon degenerate. Spring is the best time to trim the plants[238]. It is probably best to replace the plants every few years. The flowers have a rich aromatic fragrance[245]. Hyssop is a very good plant for attracting bees and butterflies to the garden[4, 20]. It is a good companion plant to grow with grapes, but it grows badly with radishes[14, 18, 20]. Special Features:Edible, Fragrant foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

## 6.2.407 Bassia scoparia

Summer Cypress, Burningbush  
5 tin 9 cyuc 2 kcaak 1 tcan 2 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Bassia scoparia is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in September, and the seeds ripen in October. The flowers are pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Leaves SeedEdible Uses: Young leaves - cooked[105, 177]. A delicious taste, they are used as a vegetable[179]. A nutritional analysis is available[218]. Some caution is advised, see the notes above on toxicity. Seed - dried and ground into a powder then mixed with ce-

reals when making bread, biscuits etc[61, 105, 177]. Very small and fiddly to use, it is also not a very reliable crop in Britain due to its late season of flowering[K]. On a zero moisture basis, the seed contains 20.4 - 27.5% protein, 8.8 - 16% fat and 3.4 - 9.4% ash[218]. In Japan the seeds are used a food garnish called tonburi.

tcanta Broom FodderThe whole plant is used as a broom[61, 151]. The green form is used[1]. An ornamental for its red fall foliage. It has also been useful in erosion control on denuded soils. It has been suggested as an agent of phytoremediation, because it is a hyperaccumulator of chromium, lead, mercury, selenium, silver, zinc, and uranium. Bassia scoparia contains higher levels of protein and oxalate than most grasses and fodder plants, thus it also serves as a good forage crop for livestock. When grown as ornamental plant, it is a good choice as evergreen foliage plant for landscapes.

dwatta Antibacterial Antifungal Antiphlogistic Astringent Cardiotonic Diuretic Dysentery Eczema Skin UrinaryAntibacterial, antifungal[178]. The leaves and fruits are cardiotonic and diuretic[218, 240]. The stems are used in the treatment of dysentery, diarrhoea and dyspepsia[218]. The seed is antiphlogistic, astringent and diuretic[176, 218]. It is used to treat skin infections such as eczema ad scabies, and diseases of the urinary tract[176, 218, 279]. The seed contains harmine, which can have adverse effects upon the gastro-intestinal tract and the central nervous system[279].

propta Seed - sow spring in a greenhouse and plant out in May. The seed can also be sown in situ in late April or early May.

nwatta An easily grown plant[200], it succeeds in ordinary garden soil[1]. Succeeds in any reasonably fertile light well-drained but moisture retentive soil in a sunny position[200]. A frost tender plant, it is grown as a spring-sown annual in Britain[1]. This species is cultivated in Korea for its use as a broom[151]. The subspecies B. scoparia trichophylla. (Schmeiss,)Schinz. and Thell. is the form most often found in cultivation in Britain[200].

## 6.2.408 Ophrys insectifera

Fly Orchid

5 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ophrys insectifera is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known  
dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able

soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Drink TeaYoung leaves and shoots - cooked as a vegetable[272]. The roots are chewed, used as a flavouring in liqueurs or made into a tea[183].

tcanta None known  
dwatta Antibacterial Antiinflammatory Antiseptic Aphrodisiac Cardiotonic Diuretic Expectorant Haemostatic Hypoglycaemic StimulantThe roots and the flowers are antibacterial, anti-inflammatory, antiseptic, aphrodisiac, cardiotonic, diuretic, expectorant, haemostatic, hypoglycaemic and stimulant[176, 238, 272]. The root is used internally in the treatment of indigestion, vomiting, coronary heart disease and angina[238, 272]. The roots are also used both internally and externally in the treatment of nosebleeds, haemorrhages from the lungs, digestive tract and uterus, and injuries[238]. The roots are harvested in the autumn, preferably from plants 6 - 7 years old, and can be used fresh or dried[238]. The flowers are used to treat vertigo and dizziness[238].

propta Seed - sow in a shady position in a cold frame preferably as soon as it is ripe, otherwise as soon as the seed is obtained. It can be very slow and erratic to germinate. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a shady position in the greenhouse or frame for at least their first winter. Make sure the pots are deep enough to accommodate the roots. Plant out into their permanent positions in late summer. Division in spring.

nwatta Requires a moist humus rich soil in a shady position in a woodland[200]. Plants are hardy to at least -15°C[238]. Nomenclature of this genus is rather confused with some botanists recognising *P. ginseng* as a variable plant that includes this species. Other botanists divide it into 4 or even 5 distinct species, giving this plant specific status. This plant has been grossly over-collected from the wild for its use as a medicinal plant and it is rapidly approaching extinction in most parts of its range[238]. The sub-species *P. pseudo-ginseng notoginseng*. (Burkill.)Hoo. and Tseng. is the form used medicinally in China[176], this plant is given a separate entry in this database[K].

## 6.2.554 Iris pseudacorus

Yellow Flag, Paleyellow iris  
5 tin 8 cyuc 1 kcaak 2 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Iris pseudacorus is a PERENNIAL growing to 1.5 m (5ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, hoverflies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: Edible Uses: CoffeeThe seed is said to make an excellent coffee substitute as long as it is well roasted[2, 7, 61, 105, 115, 244]. Caution is advised, it might be poisonous[177].

tcanta Dye Essential Ink TanninA beautiful yellow dye is obtained from the flowers[4]. A good black dye is obtained from the root if it is mixed with iron sulphate[4, 115]. It is brown otherwise[141]. The root is a source of tannin[61] and has been used in making ink[4]. A delicately scented essential oil, obtained from the roots, has been used to adulterate the oil of *Acorus calamus*[245].

dwatta Astringent Cathartic Emetic Emmenagogue OdontalgicThe fresh root is astringent, cathartic, emetic, emmenagogue and odontalgic[4, 7, 61]. A slice of the root held against an aching tooth is said to bring immediate relief[244]. It was at one time widely used as a powerful cathartic but is seldom used nowadays because of its extremely acrid nature[4]. It can also cause violent vomiting and diarrhoea[244]. When dried the root loses its acidity and then only acts as an astringent[4].

propta Seed - best sown as soon as it is ripe in a cold frame[4]. Stored seed should be sown as early in the year as possible in a cold frame. A period of cold stratification improves germination time and rates. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division in March or October. Early autumn is best[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Container, Specimen. Prefers a humus rich soil[79]. Succeeds in water up to 15cm deep[24]. Requires a moist soil, especially in early summer. Prefers a position in semi-shade[188]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A delicately scented essential oil is obtained from the dried roots[245]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Some named forms have been selected for their ornamental value[187]. Special Features: Attractive foliage, Not North American native, Invasive, Naturalizing, All or parts of this plant are poisonous, Wetlands plant, Attracts butterflies, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 6.2.555 Vaccinium smallii

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium smallii is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked.[105, 177]. The fruit is about 6mm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.556 Spiraea pyramidata

Spirea  
5 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli



without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. Some physicians believe that any effects of this medicine are caused by the mind of the patient rather than by the medicine[213]. The sap has also been applied externally in the treatment of warts[222]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of chronic catarrh, coughs, swollen liver, flatulence and ailments of the urinary tract[9].

propta Seed - sow spring or autumn in situ and only just cover the seed. Germination is usually fairly quick.

nwatta Prefers a light sandy loam and a sunny position[1]. The wild lettuce is cultivated as a medicinal plant in many areas of Europe[4, 46, 61].

### 6.2.551 Spiraea nervosa angustifolia

5 tlin 9 cyuc 1 kcaok 0 tcan 0 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta Spiraea nervosa angustifolia is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea[177, 183].

tcanta None known dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. This species has not proved to be very hardy in Britain, it is often killed back to ground level in harsh winters but usually resprouts from the base[11]. Hybridizes freely with other members of this genus[11].

### 6.2.552 Paeonia delavayi

Tree Peony, Dian mu dan 5 tlin 9 cyuc 1 kcaok 0 tcan 3 dwat 1.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfripr hpa7tli flatprikliwissip hpa7tmwattli fyfxre7t hjonli

drutta Paeonia delavayi is a deciduous Shrub growing to 1.6 m (5ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: The following use is for *P. suffruticosa*. It quite probably also applies to this closely-related species.[K - see 214]. Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or can be cooked in various dishes[183].

tcanta None known

dwatta Analgesic Antibacterial Antiinflammatory Antispasmodic Cholera DysenteryThe bark obtained from the

root has an antimicrobial effect upon various bacteria, including *Escherichia coli*, typhoid, cholera, *Staphylococcus aureus*, streptococcus hemolyticus and *Pneumococci*[250]. The root is also anti-inflammatory and has been used with success in the treatment of arthritic joint swelling[250]. The root is also analgesic, sedative and anticonvulsant, it has a high success rate in the treatment of dysentery and can also be used to treat allergic rhinitis[250]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastro-intestinal infections[238]. This remedy should only be used under the supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (*Glycyrrhiza spp*) [218]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K].

nwatta An easily grown and undemanding plant[250], it prefers a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Grows well in heavy clay soils and on chalk[184].Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -20°C[184], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. A very ornamental and long-lived plant[1], it grows rapidly and produces lots of lateral shoots[250]. It grows best in areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. This species comes into growth early in the year but unlike *P. suffruticosa* it does not seem to be subject to damage by late frosts[11]. It is probably best still given a position sheltered from the early morning sun. The branches are brittle and very subject to wind damage, especially when young[200]. This species is closely related to *P. lutea*[11]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes. The plant does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. This species will often self-sow freely when well sited[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Cultivated in China as a medicinal plant[214].

### 6.2.553 Panax pseudoginseng

Ginseng, Japanese ginseng 5 tlin 9 cyuc 1 kcaok 0 tcan 3 dwat 1 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta Panax pseudoginseng is a PERENNIAL growing to 1 m (3ft 3in) by 0.7 m (2ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline)

to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Plants are rather sparingly visited by bees and flies, setting seed only if visited[17]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

### 6.2.409 Adenophora nikoensis

5 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwattli xre7t hjonli

drutta Adenophora nikoensis is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Root-cooked[105, 177]. Best if boiled in two lots of water, it then makes excellent eating[179]. Leaves and young shoots - cooked[105, 177, 179].

tcanta None known dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1]..

nwatta Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Plants are intolerant of root disturbance[1]. A polymorphic species[58]. *Adenophora nikoensis* is sometimes separated into two different species, in which the plant with calyx lobes serrate is named *A. nipponica* and that with entire ones as *A. nikoensis*. These two forms, however, are often observed in the

same place and cannot really be separated[275]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K].

### 6.2.410 Tanacetum parthenium

Feverfew, Matricaria 5 tlin 8 cyuc 2 kcaok 2 tcan 5 dwat 0.6 m hkuc htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwattli fyfxre7t hjonli

drutta Tanacetum parthenium is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: Edible Uses: Condiment TeaThe dried flowers are used as a flavouring in cooking certain pastries[177, 183]. The plant is used in cooking to impart a deliciously aromatic bitter taste to certain foods[7]. A tea is made from the dried flowers[183].

tcanta Essential RepellentThe dried flower buds are a source of an insecticide. They are said to have the same properties as pyrethrum (obtained mainly from *T. cinerariifolia*) [61, 100, 201]. Steep 1 cupful of the dried flowers in one litre of hot soapy water for an hour. Strain, then allow to cool slightly before use[201]. An essential oil from the plant is used in perfumery[7].

dwatta Antiechymotic Antiinflammatory Antirheumatic Antispasmodic Aperient Bitter Crminative Emmenagogue Sedative Stimulant Stings Stomachic Vasodilator Vermifuge-Feverfew has gained a good reputation as a medicinal herb and extensive research since 1970 has proved it to be of special benefit in the treatment of certain types of migraine headaches and rheumatism[238, K]. It is also thought of as a herb for treating arthritis and rheumatism[254]. The leaves and flowering heads are anti-inflammatory, antispasmodic, aperient, bitter, crminative, emmenagogue, sedative, stimulant, stings, stomachic, vasodilator and vermifuge[4, 7, 21, 36, 46, 53, 100, 165]. The plant is gathered as it comes into flower and can be dried for later use[7]. Use with caution[165], the fresh leaves can cause dermatitis and mouth ulcers if consumed[238]. This remedy should not be prescribed for pregnant women[238]. A tea made from the whole plant is used in the treatment of arthritis, colds, fevers etc. It is said to be sedative and to regulate menses[222, 238]. An infusion is used to bathe swollen feet[257]. Applied externally as a tincture, the plant is used in the treatment of bruises etc[7]. Chewing 1 - 4 leaves per day has proven to be effective in the treatment of some migraine headaches[222].

propta Seed - sow spring in a greenhouse. Only just cover the seed and do not allow the pot to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer, after the last expected frosts. If you have sufficient seed it can be sown outdoors in situ during the spring. Plants usually self-sow freely and so, once you have the plant, further sowing is usually unnecessary[K]. Division in spring. Since the plants are quite short-lived, this method is not really very serviceable[K].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden. A very easily grown plant, it succeeds in an ordinary garden soil[1]. Thrives in any kind of soil[7], plants can even be grown in walls[219]. Often grown in the flower garden, feverfew is a short lived perennial but usually self-sows prolifically[7, K]. There are many named varieties selected for their ornamental value[238]. The cultivar 'Golden' (syn 'Yellow') has yellow tinted leaves[183]. The leaves have a refreshing aromatic aroma[245]. Special Features:Attractive foliage, Edible, Fragrant foliage, Not North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for

their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 6.2.411 Calamintha grandiflora

Large-Flowered Calamint

5 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli hगत्युctup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Calamintha grandiflora is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: Condiment TeaA sweet and aromatic herb tea is made from the leaves[183]. Very refreshing. The leaves are harvested as the plant comes into flower and are dried for later use[244]. Leaves - used as a flavouring. A pleasant mint-like fragrance and flavour[183].

tcanta Plants can be used for ground cover, planted about 45cm apart each way they form spreading clumps[208].

dwatta Aromatic Diaphoretic ExpectorantThe leaves are aromatic, diaphoretic and expectorant[244]. An infusion is used in the treatment of jaundice, nervous complaints, convulsions and cramps[244]. A warm poultice of the leaves may help soothe bruises and rheumatic pains[244].

propta Seed - sow spring in a greenhouse. Only just cover the seed. Germination usually takes place within 2 weeks at 21°C. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse. Plant them out into their permanent positions in the summer if they are large enough, otherwise plant them out the following spring. The seed can also be sown outdoors in a dry soil in April[244]. Division in spring or autumn[244]. Very easy, larger clumps can be planted direct into their permanent positions. It is best to pot up smaller clumps and grow them on in a cold frame until they are well rooted before planting them out in the summer. Basal cuttings in May or June[244]. They should be rooted in a sandy compost[245]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Ground cover, Rock garden, Woodland garden. Prefers a well-drained soil and a sunny position[208]. Succeeds in any good soil in sun or partial shade[187]. Established plants are drought tolerant[190], preferring a soil on the dry side[208]. The plant is pleasantly fragrant when bruised[187]. The flowers have a delicious minty scent[245]. Plants often self-sow in gardens if they are well-sited[208]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native, Invasive, Suitable for dried flowers.

### 6.2.412 Monarda citriodora

Lemon Bergamot, Lemon beebalm, Lemon Mint

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfjxre7t hjonli

drutta Monarda citriodora is a ANNUAL/PERENNIAL growing to 0.6 m (2ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condi- ment TeaLeaves - raw or cooked. They are used as a flavouring in salads and cooked foods[46, 105, 161, K] and also as a tea[183]. They have a pleasant lemon flavour[238].

tcanta Essential RepellentAn essential oil in the leaves contains a phenol and a citral[4]. No more information is given, though the oil is likely to have medicinal activity and perhaps be suitable for perfumery etc[K]. The essential oil citronellal, used as an insect repellent and in perfumery, is obtained from this plant[274].

dwatta None known  
propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°C. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn.

nwatta Landscape Uses:Border, Massing, Specimen. An easily grown plant, succeeding in ordinary garden soil so long as it is not too dry[1]. Requires a moist soil and a sunny position[1, 200]. Likes some shade. Prefers a sandy rather acidic soil[200]. This species is closely related to *M. pectinata*[235]. Said to be a perennial in some books and an annual in others, it has acted as an annual with us so far[K]. A good bee plant[200]. Subject to mildew in dry summers[200]. Special Features: Attracts birds, North American native, Edible, Fragrant foliage, Attracts butterflies.

### 6.2.413 Cerastium fontanum

Chickweed, Common mouse-ear chickweed, Big chickweed  
5 tlin 10 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Cerastium fontanum is a ANNUAL/PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[177]. Leaves and young stems - cooked[105].

tcanta None known  
dwatta None known  
propta Seed - we have no information on this species but suggest sowing the seed in spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in spring might be possible.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The subspecies *C. fontanum grandiflorum* is an annual, though subspecies *C. fontanum vulgare* is a short-lived perennial[266]. It is likely to require a moist soil in light shade.

### 6.2.414 Podophyllum hexandrum

Himalayan May Apple

5 tlin 9 cyuc 2 kcaak 0 tcan 4 dwat 0.5 m hkuc pcmhmim cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli dyatxre7t hjonli

drutta Podophyllum hexandrum is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade and its shoots growing up to the light[164]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. A twining plant[182], the stems will often die right back in the winter[273]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Flowers are formed from lateral buds produced the previous season. Any pruning should consist of removing any dead or weak growth in early spring and reducing the remainder down to the strongest pair of lateral buds[273]. Plants in this genus are notably resistant to honey fungus[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 6.2.548 Vaccinium hirtum

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium hirtum is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is about 7mm in diameter[200].

tcanta None known  
dwatta None known  
propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their

permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.549 Potentilla bicolor

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli fyfjxre7t hjonli

drutta Potentilla bicolor is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[61].

tcanta None known  
dwatta None known  
propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This is a hybrid species and it will not come true from seed. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta An easily grown plant, succeeding in a well-drained loam, preferring a position in full sun but tolerating shade[1]. It prefers an alkaline soil but tolerates a slightly acid soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.550 Lactuca virosa

Wild Lettuce, Bitter lettuce

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 1.8 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Lactuca virosa is a ANNUAL/BIENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: OilLeaves - raw or cooked[52]. Very tender[5]. Caution is advised, see the notes above on toxicity. A mild flavoured oil, used in cooking, is obtained from the seeds[4].

tcanta OilNone known  
dwatta Anodyne Antispasmodic Digestive Homeopathy Hypnotic Narcotic Sedative Tonic UrinaryThe whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. This species is probably the richest supply of lactucarium[4]. The plant also contains 'hyoscyamine', a powerful depressant of the parasympathetic nervous system[213]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sabatia angularis is an ANNUAL/BIENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tonic tea is obtained from the plant[4, 61]. The part of the plant is not specified.

tcanta None known

dwatta Antiperiodic TonicAntiperiodic, tonic[4, 61]. Used as a bitter stomachic, similar in its action to *Gentiana lutea*[207]. An infusion of the plant has been used to treat period pains[257].

propta Seed - best sown as soon as it is ripe in late summer or early autumn. Sow in a peaty soil in a moist shady border or sow in pots in a shady part of the cold frame and keep the soil moist by standing the pot in 2 - 3cm of water[1].

nwatta Requires a moist soil[200]. This species provides an excellent cut flower[200].

## 6.2.545 Ephedra intermedia

Zhong Ma Huang

5 tlin 9 cyuc 1 kcaak 0 tcan 4 dwat 1 m hkuc

htut cyutli hgatkyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Ephedra intermedia is an evergreen Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is about 7mm in diameter[200].

tcanta None known

dwatta Antiasthmatic Antidote Antihydrotic Diaphoretic Diuretic Vasoconstrictor VasodilatorMembers of this genus contain various medicinally active alkaloids (but notably ephedrine) and they are widely used in preparations for the treatment of asthma and catarrh[238]. Ephedrine has a similar effect to adrenaline in the body[176]. It acts promptly to reduce swellings of the mucous membranes and has antispasmodic properties, thus making it valuable in the treatment of asthma[4]. This species contains between 0.7 and 2.33% alkaloids, of which 10% is ephedrine[240]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. The plant also has antiviral effects, particularly against influenza[238]. The stems are a pungent, bitter, warm herb that dilates the bronchial vessels whilst stimulating the heart and central nervous system[238]. The stems are also antidote, diaphoretic, diuretic, vasoconstrictor and vasodilator[176, 238]. They are used internally in the treatment of asthma, hay fever and allergic complaints[238]. They are also combined with a number of other herbs and used in treating a wide range of complaints[238]. This herb should be used with great caution, preferably under the supervision of a qualified practitioner[238]. It should not be prescribed to patients who are taking monoamine oxidase inhibitors, or suffering from high blood pressure, hyperthyroidism or glaucoma[238]. Ephedrine is seen as a performance-boosting herb and, as such, is a forbidden substance in many sporting events such as athletics[K]. The stems can be harvested at any time of the year and are dried for later use[238]. The root is antihydrotic, it lowers blood pressure and dilates the peripheral blood vessels[176]. It is used in the treatment of night sweating and spontaneous sweating[176].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings

into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and are also lime tolerant[146]. Dioecious. Male and female plants must be grown if seed is required. Some forms are monoecious[11].

## 6.2.546 Crinum bulbispermum

Hardy swamplily

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc

htut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Crinum bulbispermum is a BULB growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root?? A number of species in this genus have edible bulbs. Although no records have been seen for this species, it is fairly hardy in Britain and the root can be as large as a football. It is worthy of investigation[K].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe, placing 2 - 3 seeds in individual pots in a greenhouse. Do not cover the seed. Sow stored seed April/May in a warm greenhouse. Once they have germinated, you can thin each pot to just one plant if required, though we have not found this to be necessary. Give an occasional liquid feed to ensure that the plants do not suffer nutritional deficiencies. Grow them on in the greenhouse for at least their first 2 years, planting them out into their permanent positions in the spring. Division of offsets in April/May or in September. When divided in the spring, the bulbs can be planted out direct into their permanent positions, if done in September, however, they should be potted up and overwintered in the greenhouse.

nwatta Easily grown in a moist soil or the garden border[90]. Requires a rich well-drained soil in a warm sheltered sunny position[188]. Plants are only hardy in the milder areas of the country, tolerating temperatures down to about -10°C[90]. It is probable that the plants may require winter protection with dry leaves or bracken[90]. Bulbs are sensitive to transplanting and may take several years to establish[200]. After this, they will usually reproduce rapidly from offsets to produce the overcrowded conditions that stimulate them to flower freely[200]. The bulbs should be planted with their necks above soil level[233]. This conflicts with another report which says that they should be planted quite deeply in the soil[1]. Only plant out good sized bulbs and do so at the end of May[1]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The flowers emit a sweet, somewhat spicy odour which is especially pronounced at nightfall[245].

## 6.2.547 Clematis brachyura

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Clematis brachyura is a deciduous Climber growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw. It must only be eaten when it is fully ripe[1, 2, 61, 105]. Juicy but insipid[130]. The fruit is about 5cm long[200]. The leaves are edible according to one report but this must be treated with some caution, see notes on toxicity above[183].

tcanta A medicinal resin is obtained from the plant. It is extracted with alcohol[64].

dwatta Antirheumatic Cancer Cholagogue Cytostatic PurgativeThe whole plant, but especially the root, is cholagogue, cytostatic and purgative. The plant contains podophyllin, which has an antimiotic effect (it interferes with cell division and can thus prevent the growth of cells). It is, therefore, a possible treatment for cancer, and has been used especially in the treatment of ovarian cancer[46, 51, 57, 64, 65, 124, 244]. However, alopecia is said to be a common side-effect of this treatment[244]. This species contains about twice the quantity of active ingredient than *P. peltatum*[211]. The roots contain several important anti-cancer lignans, including podophyllin and berberine[218]. The roots are also antirheumatic[218]. The root is harvested in the autumn and either dried for later use or the resin is extracted[238]. This plant is highly poisonous and should only be used under the supervision of a qualified practitioner[238]. It should not be prescribed for pregnant women[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in a cold frame in early spring. The seed germinates in 1 - 4 months at 15°C. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least 2 growing seasons. Plant them out into their permanent positions in the winter when the plants are dormant. Division in March/April[111].

nwatta Prefers a moist peaty soil and filtered light or shade[111, 187]. Grows well in a moist open woodland[28, 31, 200]. Hardy to about -20°C[187], it takes some years to become established[124] but is very long lived in a suitable habitat[130]. Young leaves may be damaged by late frosts but otherwise the plants are quite hardy[130]. Over collection of the plant from the wild is becoming a cause for concern as local populations are being endangered[272]. Young plants only produce one leaf each year, older plants have 2 or 3 leaves each year[211]. Plants in this genus have excited quite a lot of interest for the compounds found in their roots which have been shown to have anti-cancer activity[124]. There are various research projects under way (as of 1990)[124]. The sub-species *P. hexandrum chinense*. Wall. has larger flowers and more deeply divided leaves[187].

## 6.2.415 Asclepias ovalifolia

Oval-leaf milkweed

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Asclepias ovalifolia is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves Oil Seed SeedpodEdible

Uses: Gum Oil Oil SweetenerThe following reports refer to the closely related *A. syriaca*, and are probably also appropriate for this species[K]. Unopened flower buds - cooked. They taste somewhat like peas. They are used like broccoli[183]. Flowers and young flower buds - cooked. Used as a flavouring and a thickener in soups etc[55, 102]. The flower clusters can be boiled down to make a sugary syrup[2, 85]. The flowers are harvested in the early morning with the dew still on them[95]. When boiled up it makes a brown sugar[95]. Young shoots - cooked. An asparagus substitute[2, 4, 43, 55, 62, 95, 183]. They should be used when less than 20cm tall[159]. A slightly bitter taste[159]. Tips of

older shoots are cooked like spinach[85, 183]. Young seed pods, 3 - 4 cm long, cooked[2, 43, 55, 85]. They are very appetizing. Best used when about 2 - 4cm long and before the seed floss forms, on older pods remove any seed floss before cooking them[85, 159]. If picked at the right time, the pods resemble okra[183]. The sprouted seeds can be eaten[183]. An edible oil is obtained from the seed[55, 171]. The latex in the stems is made into a chewing gum[46, 61]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112].

tcanta Fibre Gum Latex Oil Oil Pollution Stuffing Wick-The following reports refer to the closely related *A. syriaca*, and are probably also appropriate for this species[K]. A good quality fibre is obtained from the bark and is used in making twine, cloth, paper etc[95, 112, 169]. It is of poor quality in wet seasons[112]. It is easily harvested in late autumn after the plant has died down by simply pulling the fibres off the dried stems[169]. The seed floss is used to stuff pillows etc or is mixed with other fibres to make cloth[112, 159, 169, 171]. It is a Kapok substitute, used in Life Jackets or as a stuffing material[112]. Very water repellent, it can yield up to 550 kilos per hectare[112]. The floss has also been used to mop up oil spills at sea. Candlewicks can be made from the seed floss[112, 207]. Rubber can be made from latex contained in the leaves and the stems[46, 57, 102, 159]. It is found mainly in the leaves and is destroyed by frost[112]. Yields are higher on dry soils[112]. Pods contain an oil and a wax which are of potential importance. The seed contains up to 20% of an edible semi-drying oil[74, 112]. It is also used in making liquid soap[74].

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Succeeds in any good soil[187]. Prefers a well-drained light rich or peaty soil[1, 200]. Requires a moist peaty soil and a sunny position[111, 134]. This species is closely related to *A. syriaca*[200]. A good bee plant[50, 74]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134].

## 6.2.416 Lamium album

White Dead Nettle

5 tlin 9 cyuc 2 kcaak 3 tcan 3 dwat 0.6 m hkuc

hmimhtut cyutli tcup hwicli hrasljutnyikrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lamium album is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower from May to December, and the seeds ripen from July to December. The species is hermaphrodite (has

both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw or cooked[2, 5, 7, 13, 54]. They can be added to salads or mixed with other leaves and cooked as a potherb[183]. They can also be dried for later use[12]. The leaves are a good source of vitamin A[240]. A pleasant herb tea is made from the flowers[238].

tcanta The plant has a creeping rootstock and makes a good groundcover plant for woodland edges[24].

dwatta Antiflatulent Antispasmodic Astringent Cancer Chologogue Depurative Diuretic Expectorant Homeopathy Hypnotic Ophthalmic Pectoral Resolvent Sedative Styptic Tonic Vasoconstrictor VulneraryWhite dead nettle is an astringent and demulcent herb that is chiefly used as a uterine tonic, to arrest inter-menstrual bleeding and to reduce excessive menstrual flow. It is a traditional treatment for abnormal vaginal discharge and is sometimes taken to relieve painful periods[254]. The flowering tops are antispasmodic, astringent, chologogue, depurative, diuretic, expectorant, haemostatic, hypnotic, pectoral, resolvent, sedative, styptic, tonic, vasoconstrictor and vulnerary[4, 7, 9, 13, 21, 46, 61, 165, 238, 240]. An infusion is used in the treatment of kidney and bladder complaints[9], diarrhoea, menstrual problems, bleeding after childbirth, vaginal discharges and prostatitis[238, 254]. Externally, the plant is made into compresses and applied to piles, varicose veins and vaginal discharges[7, 238, 254]. A distilled water from the flowers and leaves makes an excellent and effective eye lotion to relieve ophthalmic conditions[7]. The plant is harvested in the summer and can be dried for later use[9]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of bladder and kidney disorders and amenorrhoea[9].

propta Seed - this species usually self sows freely and should not require human intervention. When required it can be sown in situ as soon as it is ripe. Division in spring. Division succeeds at almost any time in the growing season[K]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Ground cover. A very easily grown plant, it tolerates most soils and conditions[200]. Grows well in heavy clay soils. Prefers a sunny position, though it also does well in partial shade[238]. Plants are hardy to about -25°c[187]. The white dead nettle is too weedy to be grown in the flower garden, but it does well in the wild garden and self-sows when well sited[200]. Plants seem to be immune to the predations of rabbits[233]. A good bee plant[4, 24] and a good companion plant, helping any vegetables growing nearby[14, 18]. Special Features: Attractive foliage, Invasive, Suitable for cut flowers. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 6.2.417 Mimulus guttatus

Yellow Monkey Flower; Seep monkeyflower
5 tlin 9 cyuc 2 kcak 0 tcan 2 dwat 0.6 m hkuc hmimhmtt cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Mimulus guttatus is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[94, 105, 155, 172]. A slightly bitter flavour; they are added to salads[161, 183]. The leaves are used as a lettuce substitute[257].

tcanta None known

dwatta Astringent Bach Poultice VulneraryThe plant is astringent, poultice and vulnerary[94, 172, 257]. A decoction of the leaves and stems has been used as a herbal steam bath for chest and back soreness[257]. A poultice of the crushed leaves has been applied to wounds, rope burns etc[257]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Fear or anxiety of a known origin'[209].

propta Seed - sow spring in a greenhouse and only lightly cover the seed[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can also be sown in situ in late spring after the last expected frosts[200]. Division in spring[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings of softwood, 5cm long in spring or summer[200].

nwatta Prefers rather moist places such as damp borders, margins of streams and boggy spots[1, 111]. Grows well in heavy clay soils. Thrives in full sun so long as the soil does not dry out[200], otherwise it is best grown in partial shade[187]. Grows well in shallow water, but it can be invasive[200]. Hardy to at least -20°c[187]. There is some confusion over the naming of this plant, the entry on edibility may refer to *M. luteus*, which is closely related to this species.

### 6.2.418 Fragaria nubicola

Indian Strawberry

5 tlin 9 cyuc 2 kcak 0 tcan 1 dwat 0.2 m hkuc hmimhmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Fragaria nubicola is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[272]. A very pleasant strawberry flavour[K].

tcanta None known

dwatta AstringentThe juice of the plant is used in the treatment of profuse menstruation[272]. The unripe fruit is chewed to treat blishemes on the tongue[272].

propta Seed - sow early spring in a greenhouse. The seed can take 4 weeks or more to germinate. The seedlings are very small and slow-growing at first, but then grow rapidly. Prick them out into individual pots when they are large enough to handle and plant them out during the summer. Division of runners, preferably done in July/August in order to allow the plants to become established for the following years crop[200]. They can also be moved in the following spring if required, though should not then be allowed to fruit in their first year. The runners can be planted out direct into their permanent positions.

nwatta We have very little information on this species and do not know if it will be hardy in Britain. However, judging by its native range, it is likely to succeed outdoors in many areas of the country. The following notes are based on the general needs of the genus. Prefers a fertile, well-drained, moisture retentive soil in a sunny position[200]. Tolerates semi-shade though fruit production will be reduced[38]. Likes a mulch of pine or spruce leaves[18, 24].

### 6.2.419 Panax ginseng

Ginseng, Chinese ginseng

5 tlin 9 cyuc 2 kcak 0 tcan 5 dwat 0.8 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Panax ginseng is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.7 m (2ft 4in). See above for USDA hardiness.

about 5° and should be sown as early in the year as possible in a cold frame or outdoor seedbed[200]. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature wood of the current year's growth, autumn in a frame. Layering in early spring[4].

nwatta Succeeds in any reasonably good soil[11]. Closely related to *R. parvifolius*[109]. The species in this genus are notably resistant to honey fungus[200].

### 6.2.541 Dryopteris crassirhizoma

Crown Wood-Fern

5 tlin 9 cyuc 1 kcak 0 tcan 4 dwat 1 m hkuc hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Dryopteris crassirhizoma is a FERN growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young fronds[177]. No further details, but we would advise caution. See the notes above on toxicity.

tcanta None known

dwatta Analgesic Depurative Haemostatic Resolvent VermifugeThe root stalks are analgesic, antibacterial, anti-inflammatory, antiviral, astringent, febrifuge, haemostatic, vermifuge and vulnerary[238, 279]. A decoction of the dried root is depurative and resolvent[218]. The root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent for humans and also in veterinary medicine[218, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is also taken internally in the treatment of internal haemorrhage, uterine bleeding, mumps and feverish illnesses[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. Externally, the root is used in the treatment of abscesses, boils, carbuncles and sores[238].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Prefers a moist soil[188], but is drought tolerant when well established[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.542 Rumex hydrolapathum

Great Water Dock

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 1.8 m hkuc hmimhmtt cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli prikliwis hpa7tmwatli xre7t hjonli

drutta Rumex hydrolapathum is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and

heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - cooked[2, 105, 183]. Seed - raw or cooked. It can be ground into a powder and used as a flour[102]. The seed is small and rather fiddly to harvest.

tcanta Dye Tannin TeethThe roots contain tannin. In cultivated plants, those grown on dry land contained 6 - 8% tannin whilst those grown in water contained 12.4 - 21.6%[223]. The dried and powdered root makes a good tooth cleaner[4]. Dark green to brown and dark grey dyes can be obtained from the roots of many species in this genus, They do not need a mordant[168].

dwatta Antiscorbatic Astringent OphthalmicThe root is antiscorbatic and strongly astringent[4]. It is harvested in early spring and dried for later use[4]. The green leaves are said to be an excellent application for ulcers of the eyes[4]. propta Seed - sow spring in situ. Division in spring.

nwatta Requires a moist or wet soil, also succeeding in shallow water. Avoids acid conditions in the wild. A very important food plant for the caterpillars of many species of butterfly[30].

### 6.2.543 Pennisetum alopecuroides

Chinese Fountain Grass, Fountain Grass, Swamp Foxtail Grass, Chinese Fountain Grass

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Pennisetum alopecuroides is a deciduous Perennial growing to 1.5 m (5ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be ground into a powder and used as a flour[105]. An emergency food, used when all else fails[177].

tcanta Plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover[200]. They are best spaced about 45cm apart each way[208].

dwatta None known

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination usually takes place within 3 weeks. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Border, Container, Foundation, Ground cover, Massing, Rock garden, Seashore, Specimen. Requires a light well-drained soil in a sunny position[162]. Succeeds in dry soils and, once established, tolerates drought[190]. This species is only hardy in the mild areas of Britain[162]. Plants are growing well at Cambridge botanical gardens, which is certainly not one of the milder areas of the country[K]. There are many named varieties selected for their ornamental value[200]. Plants do not flower freely in Britain except in warm sunny autumns[208]. Older clumps are more shy of flowering than young clumps[208]. Special Features:Attracts birds, Attractive foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Attractive flowers or blooms.

### 6.2.544 Sabatia angularis

Bitter Bloom, Rosepink

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 1 m hkuc

drutta Euphorbia lathyris is a ANNUAL/BIENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Oil SeedEdible Uses: OilThe seed has been used as a substitute for capers. It is very acidic and requires long steeping in salt and water, and afterwards in vinegar[2]. Great caution is advised, see the notes above on toxicity.

tcanta Biomass Latex Oil RepellentA fine clear oil is obtained from the seed[4, 74]. Yields of 42% have been obtained[240]. The oil rapidly goes rancid and acquires a dangerous acrimony[4]. It is a violent poison, producing violent purging and irritation to the intestines[4]. It can be used medicinally when fresh[4]. A latex in the leaves can be converted into vehicle fuel[160]. Reports suggest potential yields of fuel ranging from 5 to 125 barrels per hectare[218]. The growing plant is said to repel mice and moles, this is said to be most effective in its second year of growth though lots of reports cast doubt on this ability[18, 21, 54, 160]. Dynamic accumulator.

dwatta Abortifacient Antiseptic Cancer Diuretic Emetic Purgative WartsCaper spurge was used in the past as a violent purgative, whilst the rubefacient action of the leaves was employed by beggars to raise unsightly sores on their skins to elicit pity and thereby obtain more money[254]. All parts of the plant are emetic and purgative[4, 7, 21] and the plant is nowadays considered to be far too toxic for it to be used medicinally[238]. The latex in the stems has been used externally as a depilatory and to remove corns, but it is too irritant to be used safely[7, 254]. The seed is diuretic, parasiticide and purgative[176, 218]. It has been used in the treatment of dropsy, oedema, tumours, amenorrhoea, schistosomiasis, scabies and snake bites[176, 240]. The fresh seed has an antitumor action, effective against acute lymphocytic and granulocytic leukaemia[176]. The plant has anticancer activity[218]. It is also antiseptic, cathartic, emetic and purgative[218]. Use the plant with caution[4, 7, 21]. One seed capsule is said to cause catharsis, several to cause an abortion[207].

propta Seed - sow spring in situ. Germination usually takes place within 2 - 3 weeks at 20°C.

nwatta Prefers a light well-drained soil in an open position[200]. Prefers a dry soil but grows almost anywhere[1]. Often self-sows freely[1, 17]. Formerly cultivated for its fruit[17] - for the oil contained in the fruit according to another report[74]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. This genus has been singled out as a potential source of latex (for making rubber) for the temperate zone, though no individual species has been singled out[141].

## 6.2.538 Salix arenaria

5 tlin 9 cyuc 1 kcaak 3 tcan 2 dwat 1 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Salix arenaria is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour; it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172].

tcanta Soil stabilizationThe plant has a spreading root system and is an effective soil binder on sand dunes[200]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.539 Lonicera gracilipes

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 1.8 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Lonicera gracilipes is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177, 179]. It should be eaten with caution because it is possibly cathartic and emetic[179]. The fruit is about 10mm in diameter[200].

tcanta None known dwatta Cathartic EmeticCathartic, emetic[179].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200].

## 6.2.540 Rhamnus leptophyllus

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rhamnus leptophyllus is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from August to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the leaves[177].

tcanta None known dwatta None known

propta Seed - best sown in the autumn in a cold frame. Stored seed will require 1 - 2 months cold stratification at

It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: TeaRoot - chewed. This probably refers to its medicinal uses. A tea is made from the root.

tcanta None known dwatta Adaptogen Antianxiety Anticholesterolemic Appetizer Emetic Expectorant Hypoglycaemic Nerve Tonic-Ginseng has a history of herbal use going back over 5,000 years[238]. It is one of the most highly regarded of herbal medicines in the Orient, where it has gained an almost magical reputation for being able to promote health, general body vigour and also to prolong life[218]. The root is adaptogen, alterative, carminative, demulcent, emetic, expectorant, stimulant and tonic[165, 176, 178, 218]. It both stimulates and relaxes the nervous system, encourages the secretion of hormones, improves stamina, lowers blood sugar and cholesterol levels and increases resistance to disease[238]. It is used internally in the treatment of debility associated with old age or illness, lack of appetite, insomnia, stress, shock and chronic illness[238]. Ginseng is not normally prescribed for pregnant women, or for patients under the age of 40, or those with depression, acute anxiety or acute inflammatory disease[238]. It is normally only taken for a period of 3 weeks[238]. Excess can cause headaches, restlessness, raised blood pressure and other side effects, especially if it is taken with caffeine, alcohol, turpids and bitter or spicy foods[238]. The roots are harvested in the autumn, preferably from plants 6 - 7 years old, and can be used fresh or dried[238]. A dose of 10ug/ml of ginseng saponins has been shown to be significantly radio-protective when it is administered prior to gamma-irradiation[218]. The leaf is emetic and expectorant[218]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Panax ginseng for lack of stamina (see [302] for critics of commission E).

propta Seed - sow in a shady position in a cold frame preferably as soon as it is ripe, otherwise as soon as the seed is obtained. It can be very slow and erratic to germinate. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a shady position in the greenhouse or frame for at least their first winter. Make sure the pots are deep enough to accommodate the plants. Plant out into their permanent positions in late summer. Division in spring.

nwatta Requires a moist humus rich soil in a shady position in a woodland[200]. Ginseng is widely cultivated and also collected from the wild in the Orient for its root which is commonly used as a medicine[178]. The root is prepared in a number of different ways, including by steaming it for 4 hours in wicker baskets over boiling water[200].

## 6.2.420 Arisaema jacquemontii

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Arisaema jacquemontii is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[177]. Used in the same ways as potatoes[272]. The tubers are 12 - 30mm in diameter[266]. The root must be thoroughly cooked or dried before use, see the notes above on toxicity. Leaves - dried[177]. The leaves are fermented before being eaten in Nepal[272]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool moist peaty soil in the bog, woodland garden or a sheltered border in semi-shade[134, 200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. This is probably the hardiest of the Himalayan species and should succeed outdoors in a suitable position in many parts of the country[90]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Closely related to A. wardii. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

## 6.2.421 Dendranthema indicum

Chrysanthemum 5 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Dendranthema indicum is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil SeedEdible Uses: Oil TeaThe flower heads are pickled in vinegar[46, 61, 177, 183]. Young leaves - cooked[105, 177, 183]. An aromatic tea is made from the leaves[183]. Seed[183]. No more details are given but it is very small and would be rather fiddly to use.

tcanta OilThe seed contains about 16% of a semi-drying oil, but no information is given as to its uses[240, 283]. The seed is rather small, commercial extraction is probably not viable[K].

dwatta Antiphlogistic Aperient Bitter Blood tonic Depurative Eczema Febrifuge Ophthalmic Stomachic VD VulneraryThe whole plant is antiphlogistic, blood tonic, depurative, febrifuge and vulnerary[147, 174, 178]. The plant is used in China to treat eye ailments[218]. In conjunction with black pepper it is used in the treatment of gonorrhoea[240]. The leaves are depurative[240]. They are used in China in the treatment of migraine[240]. The flowers are aperient, bitter, hypotensive, stomachic and vasodilator[176, 240]. They contain the glycoside chrysanthemin that yields glucose and cyanidin on hydrolysis, together with stachydrine and an essential oil[283]. They have an antibacterial action, inhibiting the growth of Staphylococcus, E. coli, streptococcus, C. diphtheriae, Bacillus dysenteriae[176]. The flowers are used in the treatment of furuncle, scrofula, deep-rooted boils, inflammation of the throat, eyes and cervix, eczema, itchiness of the skin and hypertension[176]. They have a rejuvenating effect when used over a long period of time[283]. An essential oil obtained from the plant contains chrysanthemone, this is active on the brain centre affected by Parkinson's disease[240].

propta Seed - sow spring to early summer in a greenhouse and only just cover the seed[200]. It usually germinates in 10 - 18 days at 15°C but if it does not germinate within 4 weeks then try chilling the seed for 3 weeks in the salad compartment of a fridge[164]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most well-drained fertile soils in a sunny position[1, 200]. Plants tolerate temperatures down to about -10°C and should succeed outdoors in most parts of Britain[260]. This species is closely related to *D. x grandiflorum* (the cultivated chrysanthemum) according to one report[58] whilst another says that it is a parent of the cultivated chrysanthemum[1]. It has been proposed (1999) to re-store this species to *Chrysanthemum* as *C. indicum* L. since the plant is so widely known under this name. When bruised, the foliage has a pungent refreshing fragrance that is somewhat lemon-like and reminiscent of chamomile[245].

### 6.2.422 Crocus serotinus

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Crocus serotinus* is a CORM growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from November to May, in flower from November to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, butterflies. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Colouring CondimentThe flowers are used as a saffron substitute in flavouring food and colouring it yellow[177, 183].

tcanta DyeThe yellow dye obtained from the stigmas yields a yellow dye, it is a saffron substitute[177].

dwatta None known

propta Seed - best sown as soon as it is ripe in a light sandy soil in pots in a cold frame[1]. The seed can also be sown in a cold frame in early spring[1]. Sow thinly because the seed usually germinates freely[1], within 1 - 6 months at 18°C[164]. Unless the seed has been sown too thickly, do not transplant the seedlings in their first year of growth, but give them regular liquid feeds to make sure they do not become deficient. Divide the small bulbs once the plants have died down, planting 2 - 3 bulbs per 8cm pot. Grow them on for another 2 years in a greenhouse or frame and plant them out into their permanent positions when dormant in late summer[K]. Plants take 3 - 4 years to flower from seed[200]. Division f the clumps after the leaves die down in spring[1, 200]. The bulbs can be planted out direct into their permanent positions.

nwatta Succeeds in most soils, conditions and positions[1]. Plants grow well in a peaty soil in a bulb frame and should succeed outdoors in a sandy peaty soil[90]. The subspecies *C. serotinus austriacus* can be naturalized in grass or beneath deep rooting trees on light well-drained soils[200]. Plants tend to move considerably from their original planting place because of their means of vegetative reproduction, it is therefore wise not to grow different species in close proximity[1]. Any planting out is best done in late spring or early summer[245]. Mice are very fond of the corms of this species[1]. Plants take 3 - 4 years to flower from seed[200]. The flowers are only open during the day time, closing at night[245].

### 6.2.423 Adenophora lamarkii

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Adenophora lamarkii* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. A sweet flavour[74].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface

sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Intolerant of root disturbance[1]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K].

### 6.2.424 Eryngium campestre

Field Eryngo

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta *Eryngium campestre* is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked. An asparagus substitute[105, 177, 183]. Root - cooked. Used as a vegetable or candied and used as a sweetmeat[46, 183]. Easily digested[7, 61].

tcanta None known

dwatta Antispasmodic Aromatic Diaphoretic Diuretic Expectorant Galactofuge StimulantThe root is antispasmodic, aromatic, diaphoretic, diuretic, expectorant, galactofuge and stimulant[4, 7]. It should be harvested in the autumn from plants that are at least 2 years old[4]. The root promotes free expectoration and is very useful in the treatment of debility attendant on coughs of chronic standing in the advanced stages of pulmonary consumption[4]. Drunk freely it is used to treat whooping cough, diseases of the liver and kidneys and skin complaints[4, 238].

propta Seed - best sown as soon as it is ripe in early autumn on the surface of a well-drained compost in a cold frame[200]. The seed can also be sown in spring. It usually germinates in 5 - 90 days at 20°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring or autumn. Take care since the plant resents root disturbance[200]. Root cuttings in autumn or winter[200].

nwatta Requires a well-drained soil and a sunny position[1]. Prefers a light sandy soil but tolerates most soil types including lime and poor gravels[200]. The plant has deep and wide-ranging roots, it can spread freely in the garden and become difficult to eradicate[4]. Plants should be put in their final position whilst small since they resent root disturbance[200]. The plant is often used in dried flower arrangements since it retains its colour for a long time[7].

### 6.2.425 Anacamptis pyramidalis

Pyramidal Orchid

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli prikwiisslip hpa7tmwatli xre7t hjonli

drutta *Anacamptis pyramidalis* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

(loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaAn infusion of the leaves tastes like China tea[207].

tcanta None known

dwatta *TonicAn* infusion of the leaves is esteemed as a restorative tonic[207].

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. This species is closely related to *S. salicifolia* and is often treated as no more than a variety of it[11]. Hybridizes freely with other members of this genus[11].

### 6.2.534 Peucedanum palustre

Marsh Hog's Fennel, Hogfennel

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta *Peucedanum palustre* is a BIENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: CondimentThe root can be used as a ginger substitute[2, 4, 17, 115, 183].

tcanta None known

dwatta Antispasmodic Epilepsy StimulantThe root is stimulant[4]. It is used in the treatment of epilepsy[4].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta An easily grown plant, it succeeds in any moisture-retentive soil in a sunny position[200]. Suitable for group plantings in the wild garden[200].

### 6.2.535 Thalictrum aquilegifolium

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Thalictrum aquilegifolium* is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or roasted[22, 46, 61]. Caution is advised, there is one report that suggests that the root is particularly poisonous[13]. Young leaves - cooked[105]. Caution is advised, they are possibly poisonous.

tcanta None known

dwatta CytostaticCytostatic[65].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[K]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in an outdoor seedbed in spring[111]. Plant them into their permanent positions the following spring. Division in spring as new growth commences or in the autumn[111]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Succeeds in most fairly good soils in sun or semi-shade[1, 111]. Prefers a humid rich soil[111]. A very ornamental plant[1], it is hardy to about -25°C[187]. Grows well on a woodland edge[188]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.536 Aconitum heterophyllum

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Aconitum heterophyllum* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from September to October. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves and root - cooked[177]. This report should be treated with great distrust due to the poisonous nature of the genus, but see the notes above on known hazards[K].

tcanta None known

dwatta Analgesic Antiinflammatory Antiperiodic Aphrodisiac Astringent Cholagogue Febrifuge TonicThe dried root is analgesic, anti-inflammatory, antiperiodic, aphrodisiac, astringent, cholagogue, febrifuge and tonic[4, 240]. It is used in India in the treatment of dyspepsia, diarrhoea and coughs[240, 243]. It is also used in Tibetan medicine, where it is said to have a bitter taste and a cooling potency[241]. It is used to treat poisoning from scorpion or snake bites, the fevers of contagious diseases and inflammation of the intestines[241]. The root is best harvested in the autumn as soon as the plant dies down and is dried for later use[4]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in moist soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. The roots of this plant are extensively collected from the wild for medicinal use and the species is becoming much rarer in many areas of its range[272]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

### 6.2.537 Euphorbia lathyris

Caper Spurge, Moleplant

5 tlin 9 cyuc 1 kcaak 3 tcan 2 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli



August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

tcanta BeddingThe straw is used for bedding[61].  
dwatta None known

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in a damp to wet soil in full sun or shade[162, 200]. A very aggressive and invasive plant[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.530 *Kalimeris pinnatifida*

Japanese Aster

5 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Kalimeris pinnatifida* is a PERENNIAL growing to 1.5 m (5ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants - cooked[1, 46, 61, 105, 177].

tcanta None known  
dwatta None known

propta Seed - sow spring in a greenhouse and only just cover. Keep the compost moist. The seed usually germinates in 2 - 3 weeks at 15°C[138]. Grow on in cool conditions, about 10°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. This should be done at least every 3 years in order to maintain the vigour of the plant.

nwatta Landscape Uses:Border, Container, Massing, Specimen. Prefers a moist loamy soil[138] though it succeeds in most soils[1]. Cultivated as a vegetable in Japan[46].

### 6.2.531 *Lolium perenne*

Perennial Ryegrass, Italian ryegrass, Darnel, Lyme Grass, Terrell Grass, English Ryegrass, Strand Hk  
5 tlin 7 cyuc 1 kcak 0 tcan 1 dwat 1 m hkuc  
htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli frusflatprikli-wissliphom hpa7tmwatli xre7t hjonli

drutta *Lolium perenne* is an evergreen Perennial growing to 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid, very alkaline and saline soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. Used as a cereal[177]. The seed has a nutritional value similar to oats (*Avena sativa*) and contain gluten[269]. An emer-

gency food, it is only used when all else fails[177]. The seed is rather small and fiddly to use[K]. Yields of 1 tonne per hectare have been achieved, though around 500kg is a more common yield[269].

tcanta BiomassThe plant has the potential to be used as a source of biomass. Yields of up to 25 tonnes per hectare have been reported from Europe. In the absence of definitive yield information an average yield of 17.5 tonnes of dry matter per hectare per year and an energy content of 17.5 GJ per metric tonne are assumed[269].

dwatta Astrigent Cancer MalariaThe plant has occasionally been used in the treatment of cancer, diarrhoea, haemorrhages and malaria[269].

propta Seed - sow in situ in the spring. It is also possible to sow the seed in situ in the autumn in most parts of Britain. This will give larger plants and heavier yields.

nwatta Landscape Uses:Erosion control, Ground cover. Adapted to mild, humid temperate climates, this species grows best on rather heavy, rich, moist soils, but also does well on well-manured lighter soils with sufficient moisture[269]. It dislikes shade and requires a well-drained soil[200]. It prefers a pH in the range 6 - 7, though it can tolerate a range from 4.5 - 8.2[269]. Plants are moderately drought resistant, they tolerate atmospheric pollution and salt in the soil, and can also succeed when planted on mine-spoil[269]. They prefer an annual precipitation in the range of 21 - 176cm[269]. Many cultivars have been developed by selection of individual plants, clones and families for specific purposes, such as for lawns, pastures and hay[269]. A fast growing plant, it combines particularly well with white clover (*Trifolium repens*)[269]. Special Features: Not North American native, Naturalizing.

### 6.2.532 *Lonicera gracilipes glabra*

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 1.8 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lonicera gracilipes glabra* is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177, 179]. It should be eaten with caution because is possibly cathartic and emetic[179]. The fruit is about 10mm in diameter[200].

tcanta None known

dwatta Cathartic EmeticCathartic, emetic[179].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Grows best in a good moist soil in a sunny position, it does not fruit so well in the shade[200].

### 6.2.533 *Spiraea alba*

White Meadowsweet

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Spiraea alba* is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium

kcakta Edible Parts: RootEdible Uses: DrinkTuber - cooked[2, 4, 61]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[5, 100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Requires a deep rich soil[1, 135]. Prefers a hot well-drained bank[42], growing well in a sunny dry border or on a scree[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. Plants can be grown in lawns in calcareous soils, they should not be cut down until the leaves are dying down in the summer[230]. During the day the flowers have a pronounced aroma of vanilla in order to attract pollinating butterflies. In the evening, when damp with dew, the smell is more goat-like and this acts as a repellent to moths[245].

### 6.2.426 *Oxalis grandis*

Great Yellow Woodsorrel

5 tlin 7 cyuc 2 kcak 1 tcan 1 dwat 0.2 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Oxalis grandis* is a ANNUAL/PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves are tart [1-2]. Leaves - raw or cooked[2, 7, 12, 37]. A delicious lemony flavour, the leaves make a refreshing, thirst-quenching munch and are also added to salads, soups, sauces etc[183]. This leaf should be used in moderation[4, 5, 9, 76], see the notes above on toxicity. Flowers - raw. A decorative addition to salads[K]. The plant can be toxic and only small amounts should be eaten. Large quantities may cause trembling, cramps, and staggering as in grazing animals.

tcanta The juice of the leaves removes iron mould stains from linen[6, 66, 115]. Plants can be grown as a ground cover in woodland or under the shade of shrubs[208].

dwatta Some *Oxalis* species have medicinal properties but no information could be found for this species. For example *Oxalis acetosella*: The fresh or dried leaves are anodyne, antiscorbutic, astringent, diuretic, emmenagogue, expectorant, febrifuge, irritant and stomachic[4, 7, 9, 21]. A decoction is used in the treatment of fevers, both to quench the thirst and allay the fever[4]. Externally, the leaves are crushed and applied locally to dispel boils and abscesses, they also have an astringent affect on wounds[7]. When used internally, some caution is advised due to the oxalic acid content of the leaves[4], the plant is contra-indicated for people suffering from gastritis or a calculus condition[7].

propta Seed - best sown as soon as it is ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Annual or perennial herb preferring shade to semi-shade and a mesic - moist to slightly dry soil. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. Bloom Color: Yellow. Bloom Time: May to Sep.

### 6.2.427 *Mentha satureioides*

Native Pennyroyal

5 tlin 9 cyuc 2 kcak 0 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta *Mentha satureioides* is a PERENNIAL growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. Used as a flavouring in salads or cooked foods. A herb tea is made from the leaves.

tcanta Essential Repellent StrewingAn essential oil is obtained from the whole plant. It has a scent intermediate between pennyroyal and peppermint[238]. The plant is used as an insect repellent[154]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Abortifacient Alterative Antiseptic Antispasmodic Blood purifier Carminative Digestive Emmenagogue TonicThe leaves and flowering plant are alterative, antispasmodic, blood purifier, digestive, emmenagogue and tonic[152, 154, 238]. A tea made from the leaves has traditionally been used in the treatment of fevers, coughs, colds, headaches, digestive disorders, menstrual complaints and various minor ailments[152, 222, 238]. It can be used as a substitute for both pennyroyal (*Mentha pulegium*) and peppermint (*Mentha x piperita*)[238]. Like those species, it should not be prescribed for pregnant women since it can

procure an abortion[238]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222] and can cause abortions[152, 154].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. Prefers a slightly acid soil[16]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it also succeeds in partial shade. Plants are hardy to about -15°c[238]. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The whole plant has a mint-like aroma. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near cabbages and tomatoes, helping to keep them free of insect pests. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.428 Cardamine rotundifolia

American Water Cress, American bittercress
5 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tucphja7nhs6s hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfixre7t hjonli

drutta Cardamine rotundifolia is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to August, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[105. 161, 177]. A hot water-cress like flavour[2, K].

tcanta None known
dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°c[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils so long as they are not dry[1]. Grows wild in shallow water[235]. Prefers a moist humus rich soil in shade or semi-shade[200]. A mat-forming stoloniferous species[200].

## 6.2.429 Centranthus ruber

Red Valerian, Fox’s Brush, Jupiter’s Beard
5 tin 8 cyuc 2 kcaak 1 tcan 1 dwat 0.9 m hkuc

htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Centranthus ruber is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Young leaves - raw or cooked as greens[2, 5, 52, 115]. Exceedingly good, either in salads or cooked as a vegetable[4]. This differs from our own experience, whilst the leaves can be added to salads they are rather bitter and rather less than desirable[8, 183, K]. Root - cooked[4]. Used in soups[4].

tcanta MiscellanyThe seeds were used in ancient embalming[89, 148].

dwatta Miscellany NervineRed valerian is sometimes confused in herbals and folk tradition with the true valerian (Valeriana officinalis). Whilst true valerian has a very strong action on the nervous system, this species has no known medical properties[244, 268]. The plant is nervine[148]. This report possibly confuses this plant with the true valerian, Valeriana officinalis, which is a very effective nervine.

propta Seed - sow February to May in situ or as soon as it is ripe in situ and only just cover the seed. Germination is usually rapid. Division in spring. Cuttings, summer, in a cold frame.

nwatta Landscape Uses:Border, Ground cover, Massing, Rock garden, Seashore. Grows well in ordinary moist, well-drained garden soil and on dry walls[1, 111, 200]. Prefers a sunny position[111], though it also succeeds in semi-shade[219]. Thrives on chalk[200], poor soils[188] and in sandy soils[187]. Established plants are drought tolerant[190]. This species is hardy to about -15°c[187, 200]. Plants are generally long-lived and grow especially well in maritime areas, where they are a common feature of hedgerows and walls[219, K]. A very ornamental plant[1], it attracts moths and butterflies[30]. The flowers have an unpleasant smell like perspiration[245]. Special Features: Attracts birds, Attractive foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Fragrant flowers. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 6.2.430 Plantago lanceolata

Ribwort Plantain, Narrowleaf plantain

5 tin 9 cyuc 2 kcaak 3 tcan 3 dwat 0.5 m hkuc htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli fyfixre7t hjonli

drutta Plantago lanceolata is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to August, and the seeds ripen from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally

(has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants - cooked[105, 116, 177].

tcanta None known
dwatta None known

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 6.2.526 Spiraea blumei

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Spiraea blumei is a deciduous Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves are a tea substitute[177, 183].

tcanta None known
dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[11]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Hybridizes freely with other members of this genus[11]. A variable species, it is often confused in gardens with *S. trilobata*[11, 200].

## 6.2.527 Vaccinium virgatum

Rabbit-Eye Blueberry, Smallflower blueberry
5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium virgatum is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs)

and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is about 5mm in diameter[200].

tcanta None known
dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. This species is closely related to *V. corymbosum*[182] and to *V. amoenum*[1]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.528 Cuscuta japonica

Japanese Dodder

5 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cuscuta japonica is a ANNUAL CLIMBER growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young growth, boiled and seasoned[177].

tcanta None known

dwatta Aphrodisiac Demulcent Diaphoretic Enuresis Hepatic Ophthalmic TonicA sweet, pungent herb that acts mainly as a liver and kidney stimulant[238], the seed of Japanese dodder is aphrodisiac, demulcent, diaphoretic, enuresis, hepatic and tonic[147, 176, 178, 218, 238]. A decoction of the seed is used to treat a variety of complaints including diarrhoea, vaginal discharge, enuresis, backache, constipation and impotence[218]. The young shoots are used to treat sore eyes[218].

propta Seed - best sown as soon as it is ripe in the autumn, by lodging it among the stems of a host plant[238].

nwatta This is a parasitic species that is devoid of leaves, roots or chlorophyll and so is totally dependant upon its host[238]. It must be grown next to the host plant, which it penetrates with suckers in order to obtain nutriment[238]. Plants are hardy to at least -15°c[238]. A climbing plant, supporting itself by twining around other plants[238].

## 6.2.529 Carex riparia

Great Pond Sedge

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Carex riparia is an evergreen Perennial growing to 1.5 m (5ft) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from July to

drutta *Paeonia suffruticosa* is a deciduous Shrub growing to 2 m (6ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or cooked in various dishes[183].

tcanta FuelThe stems are used as firewood[11]. The plant is quite slow growing so could not really be seen as a source of fuel[K].

dwatta Analgesic Antibacterial Antiinflammatory Antipyretic Antispasmodic Emmenagogue Sedative Styptic TonicThe root and root bark is analgesic, antibacterial, anti-inflammatory, antipyretic, antispasmodic, emmenagogue, sedative, styptic and tonic[46, 61, 174, 176, 178, 218, 279]. An extract of the plant has antibacterial activity, inhibiting the growth of *Staphylococcus*, *Bacillus dysenteriae*, *Typhoid bacillus*, *Paratyphoid bacillus*, *Proteus*, *Pseudomonas*, *E. coli*, *Haemophilus pertussis* and *Streptococcus*[176, 218]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastrointestinal infections[238]. This remedy should only be used under the supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (*Glycyrrhiza spp*)[218]. A tea made from the dried crushed petals of various penny species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K].

nwatta Landscape Uses:Border, Foundation, Seashore, Specimen. Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -20°c[184], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. Plants come into growth early in the year and are then subject to damage by late frosts, they are therefore best sited in a position that is shaded from the early morning sun[11]. The branches are brittle and very subject to wind damage, especially when young[200]. There is some confusion over the name of this species, Chinese botanists believing that it was based on a cultivar. They do not recognise this name, instead raising to specific status two of its sub-species as *P. rockii* (Haw. and Lauener.) Hong, and *Li. and P. jishanensis* Hong, and *W.Z.Zhao* (syn *P. spontanea* (Rehder.) Hong, and *W.Z.Zhao.*)[214]. Most modern treatments no longer recognise this as a separate species, though some people use the name to house the large number of garden forms of tree peonies that have been developed over the centuries[250]. A very ornamental plant[1], there are many named varieties[182]. It grows best in areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. The flowers of some forms of this species

are pleasantly scented[245]. Scented forms include 'Flora', 'Fragrans Maxima', 'Kimpai' and 'Kokuho'[245]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. The plant does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Cultivated in China as a medicinal plant[214]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

### 6.2.524 Viburnum phlebotrichum

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli dyatre7t hjonli

drutta *Viburnum phlebotrichum* is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The ovoid fruit is about 9mm long and contains a single large seed[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200].

### 6.2.525 Aster yomena

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

drutta *Aster yomena* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite

poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves SeedEdible Uses: Young leaves - raw or cooked[12, 46, 61]. They are rather bitter and very tedious to prepare, the fibrous strands are best removed prior to eating[9, 183]. The very young leaves are somewhat better and are less fibrous[K]. Seed - cooked. Used like sago[177, 183]. The seed can be ground into a powder and added to flours when making bread, cakes or whatever.

tcanta Dye Fibre StarchA good fibre is obtained from the leaves[4], it is said to be suitable for textiles[115]. A mucilage from the seed coats is used as a fabric stiffener[4]. It is obtained by macerating the seed in hot water[100, 115]. Gold and brown dyes are obtained from the whole plant[168]. Dynamic accumulator.

dwatta Antibacterial Antidote Astringent Demulcent Expectorant Haemostatic Laxative Ophthalmic PoulticeRibwort plantain is a safe and effective treatment for bleeding, it quickly staunches blood flow and encourages the repair of damaged tissue[254]. The leaves contain mucilage, tannin and silic acid[244]. An extract of them has antibacterial properties[240]. They have a bitter flavour and are astringent, demulcent, mildly expectorant, haemostatic and ophthalmic[9, 13, 21, 145, 165, 222, 244, 254]. Internally, they are used in the treatment of a wide range of complaints including diarrhoea, gastritis, peptic ulcers, irritable bowel syndrome, haemorrhage, haemorrhoids, cystitis, bronchitis, catarrh, sinusitis, asthma and hay fever[238, 254]. They are used externally in treating skin inflammations, malignant ulcers, cuts, stings etc[4]. The heated leaves are used as a wet dressing for wounds, swellings etc[213, 222]. The root is a remedy for the bite of rattlesnakes, it is used in equal portions with *Marrubium vulgare*[207]. The seeds are used in the treatment of parasitic worms[213]. Plantain seeds contain up to 30% mucilage which swells up in the gut, acting as a bulk laxative and soothing irritated membranes[238]. Sometimes the seed husks are used without the seeds[238]. A distilled water made from the plant makes an excellent eye lotion[7].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. A sowing can be made outdoors in situ in mid to late spring if you have enough seeds.

nwatta Succeeds in any moderately fertile soil in a sunny position[200]. Plants also succeed in very poor land[4]. An important food plant for the caterpillars of many species of butterflies[30]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fibrous dividing into a large number of fine roots [2-1].

### 6.2.431 Epimedium sagittatum

Yin Yang Huo

5 tlin 9 cyuc 2 kcak 0 tcan 3 dwat 0.5 m hkuc hmim cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli dyatre7t hjonli

drutta *Epimedium sagittatum* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant and young leaves - cooked[105]. Soaked and then boiled[177]. (This suggests that the leaves are bitter and need to be soaked in order to remove the bitterness.)

tcanta A good ground cover plant[200].

dwatta Antirheumatic Aphrodisiac Carminative Expectorant Infertility Kidney Ophthalmic Tonic VasodilatorThe whole plant is antirheumatic, aphrodisiac, carminative, expectorant, ophthalmic and vasodilator. Used as a kidney tonic, it also treats sterility and barrenness[147, 178, 238].

It is taken internally in the treatment of asthma, bronchitis, cold or numb extremities, arthritis, lumbago, impotence, involuntary and premature ejaculation, high blood pressure and absentmindedness[238]. It should be used with some caution since in excess it can cause vomiting, dizziness, thirst and nosebleeds[238]. The plant is harvested in the growing season and dried for later use[238].

propta Seed - best sown in a cold frame as soon as it is ripe in late summer[200, 280]. Sow stored seed as early as possible in the year in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the cold frame or greenhouse for at least their first winter[K]. Plant them out in mid to late summer[K]. Division in July/August according to one report, in late spring according to another[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Cuttings in late summer[200].

nwatta Succeeds in any fertile humus-rich soil[200], preferring a moist but well-drained peaty loam[1, 280]. Grows best in the light dappled shade of a woodland[200, 280]. Plants can succeed in the dry shade of trees[233]. A shallow-rooting plant, the rhizomes creeping just below the soil and the finer roots occupying the top 30cm of the soil[280]. Although the plants are hardy to at least -15°c, the young growth in spring can be killed by frosts[238]. Grows well in the rock garden or wild garden[1]. Plants are self-sterile and so more than one clone is required for cross-fertilization in order for seed to be produced. Plants will often hybridise with other species growing nearby[280]. Cultivated as a medicinal plant in Japan[58]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 6.2.432 Rheum compactum

5 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Rheum compactum* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Leaf stem - cooked[2, 74]. A tart flavour, it can be used as a rhubarb substitute[105].

tcanta None known

dwatta None known

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Hardy to about -20°c[200]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

### 6.2.433 Cirsium japonicum

No-Azami, Japanese thistle

5 tlin 9 cyuc 2 kcak 2 tcan 2 dwat 0.9 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

*drutta Cirsium japonicum* is a BIENNIAL/PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves **Oil Root**Edible Uses: Oil-Leaves - cooked[61, 105, 177]. Very palatable in the spring, they are used with the young roots[179].

**tcanta Oil**The seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

**dwatta Antiinflammatory Diuretic Haemostatic** SypticThe roots are anti-inflammatory, diuretic and haemostatic[61, 147, 176, 178]. A decoction of the dried roots is used in the treatment of boils and carbuncles, acute appendicitis, uterine bleeding, haematuria, nose bleeds, haematemesis and traumatic bleeding[147]. The leaf is haemostatic and diuretic[218]. The stem is haemostatic[218].

**propta Seed** - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°C[164]. Division in spring or autumn.

**nwatta** An easily grown plant, succeeding in any ordinary garden soil in a sunny position[200]. Cultivated for cut flowers in Japan[58]. There are some named forms selected for their ornamental value[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 6.2.434 Ophrys holoserica

Late Spider Orchid

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli kyucutcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

*drutta Ophrys holoserica* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from October to July, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

**tcanta** None known

**dwatta Demulcent Nutritive**Salep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

**propta Seed** - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200].

It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

**nwatta** Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Plants are best grown in a shady position[188]. Grows well in a sunny dry border or on a scree[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. A very rare species in Britain, where it is on the verge of extinction, it is rather more common in southern Europe[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

### 6.2.435 Oxalis enneaphylla

Scurvy Grass

5 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc htut cyutli kyucutcup hwicli hrasjut hpa7tli flatprikliwis hpa7tmwatli dyaxbre7t hjonli

*drutta Oxalis enneaphylla* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Flowers **Leaves** **Root**Edible Uses: Leaves - raw or cooked[2, 177]. Use in moderation, see notes at top of sheet. Flowers - raw or cooked[K]. Root[105]. No further details are given.

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown as soon as ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** Easily grown in a well-drained humus rich sandy soil in a warm dry sunny position[1, 200]. Requires a sheltered position[1]. A very ornamental plant, it does well in

hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** **Fruit**Edible Uses: The fruit is almost certainly edible, but we do not know what its quality is[K].

**tcanta Hedge Hedge**The plant has viciously spiny leaves and makes a good boundary shrub[200].

**dwatta Antibacterial Antitumor Dysentery**Berberine, universally present in rhizomes of Berberis and Mahonia species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

**propta Seed** - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. This species is a bi-generic hybrid and, if seed is produced, it is very unlikely to breed true. Wounded nodal semi-ripe cuttings in late summer or early autumn[200].

**nwatta** Succeeds in most soils in sun or shade[182, 200]. Prefers a fertile well-drained soil[188]. Plants only flower and fruit after a long warm growing season[200]. Plants are reputedly immune to rust[200].

### 6.2.520 Senecio nemorensis

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

*drutta Senecio nemorensis* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** **Stem**Edible Uses: Young stems - pickled[177]. Some caution is advised, see the notes above on toxicity.

**tcanta** None known

**dwatta Hypoglycaemic Urinary**Urinary tract infections, gout, rheumatism and stone formation in the urinary tract. Lowers blood sugar. The herb is contraindicated in pregnancy and nursing and children under 12. Recommended only for external use. Do not apply to broken skin [301].

**propta Seed** - sow spring in a greenhouse and only just cover the seed. Make sure the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer if they have grown sufficiently. Otherwise, grow them on in the greenhouse or cold frame for their first winter and plant them out the following year after the last expected frosts. Division in spring[200]. Root cuttings in early spring[200].

**nwatta** Succeeds in a sunny position in most well-drained moderately fertile soils[200]. The sub-species *S. nemorensis fuchsii*. (Gmel.)Celak. is the form used for food in Asia[177].

### 6.2.521 Weigela floribunda

Crimson weigela

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

*drutta Weigela floribunda* is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** **Leaves**Edible Uses: Young leaves - cooked[177]. A famine food, they are only used when all else fails.

**tcanta** None known

**dwatta** None known

**propta Seed** - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter or early spring. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Softwood basal cuttings, 10 - 12cm long, in a sandy soil in a cold frame in early summer[200]. Cuttings of half-ripe wood, 8 - 10 cm with a heel, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth. 20 cm long, November in a sheltered outdoor nursery bed[200].

**nwatta** An easily grown plant, succeeding in most fertile soils[11, 200]. Prefers a moist well-drained soil in sun or partial shade[200]. Tolerates atmospheric pollution[200]. Plants are very hardy, tolerating temperatures down to about -23°C[200]. Plants are very floriferous and can exhaust themselves, literally flowering themselves to death. The flowers are borne in the leaf nodes of the previous years growth and any pruning is therefore best done as soon as the plant has finished flowering[182]. Closely related to *W. coraeensis*[11]. There are a number of named forms, selected for their ornamental value[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.522 Sorbus gracilis

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli xre7t hjonli

*drutta Sorbus gracilis* is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** **Fruit**Edible Uses: Fruit - raw or cooked[105]. The fruit is up to 1cm across[200].

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

**nwatta** Succeeds in most reasonably good soils in an open sunny position[11]. Prefers an acid soil[121]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188].

### 6.2.523 Paeonia suffruticosa

Moutan, Moutan peony, Tree Peony, Japanese Tree Peony

5 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwissiip hpa7tmwatli fyifxre7t hjonli

wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils but disliking waterlogged soils[11, 200]. Grows well in heavy clay soils. Plants can be pruned back quite severely, they resprouts well from the base[200]. Hybridizes freely with other members of this genus[1]. This species is closely related to *B. gyalacina*[11, 200].

## 6.2.516 *Callicarpa japonica*

Beautyberry, Japanese callicarpa, Japanese Beautyberry  
5 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwsh hpa7tmwatli xre7t hjonli

drutta *Callicarpa japonica* is a deciduous Shrub growing to 2 m (6ft 7in) at a medium rate. It is in flower in August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves are a tea substitute[177, 183].

tcanta None known  
dwatta None known

propta Seed - sow February in a greenhouse[78]. Only just cover the seed[138]. Germination usually takes place within 1 - 3 months at 18°c[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10cm long, July/August in a frame. High percentage[78]. Cuttings of mature wood of the current season's growth with a heel[78] taken in early spring[200].

nwatta Landscape Uses:Border, Cascades, Container, Erosion control, Massing, Standard, Specimen. Requires a sunny position or light dappled shade[11, 200]. Prefers a highly fertile well-drained loamy soil[11, 200]. This species is only really hardy in the milder parts of Britain, requiring a warm sunny corner[11, 182], though some forms should prove to be hardier. A very ornamental[1] and polymorphic species[58]. Requires cross-pollination for good fruit production[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Fragrant foliage, Not North American native, Inconspicuous flowers or blooms.

## 6.2.517 *Rhododendron indicum*

Rhododendron

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Rhododendron indicum* is an evergreen Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flowers[105, 177, 183]. No further details are given but some caution is advised, see the notes above on toxicity. Leaves[105, 177, 183]. No further details are given but some caution is advised, see the notes above on toxicity. The galls on the leaves are also said to be edible[177]. The report does not say if the galls are eaten before or after the insect has left. Caution is advised, see notes above on toxicity.

tcanta Plants can be grown as ground cover when spaced about 1 metre apart each way[208].

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow

the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. Plants do not succeed in all parts of Britain, they are hardy by the coast and succeed in warmer gardens inland[1]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 6.2.518 *Equisetum telmateia*

Giant Horsetail

5 tlin 9 cyuc 1 kcaak 3 tcan 1 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwsh hpa7tmwatli hjonli

drutta *Equisetum telmateia* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in March, and the seeds ripen in April. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Strobil (the fertile shoots in spring - raw or cooked[256]. The tough outer fibres are peeled off, or can be chewed and then discarded[256]. The vegetative shoots, produced from late spring onwards, were occasionally cleaned of their leaves, sheathing and branches and then eaten by native North American Indians, but only when very young and tightly compacted[256]. Root - cooked[257].

tcanta Basketry Fungicide Hair Liquid feed Polish SandpaperThe stems are very rich in silica[4]. They are used for scouring and polishing metal[1, 4, 46, 61, 99, 257] and as a fine sandpaper[54, 99, 257]. The stems are first bleached by repeated wetting and drying in the sun[74]. They can also be used as a polish for wooden floors and furniture[46, 178]. The infused stem is an effective fungicide against mildew, mint rust and blackspot on roses[14]. It also makes a good liquid feed[54]. Used as a hair rinse it can eliminate fleas, lice and mites[213]. The black roots have been used for imbrication on coiled baskets[257].

dwatta Astringent Diuretic PouliticeThe plant is astringent and diuretic[257]. A decoction has been used to treat 'stoppage of urine'[257]. A poultice of the rough leaves and stems is applied to cuts and sores[257].

propta Spores - best collected as soon as they are ripe in the spring and surface-sown immediately on a sterile compost. Keep moist and pot up as soon as the plants are large enough to handle. Very difficult[200]. Division. The plants usually spread very freely when well sited and should not really need any assistance.

nwatta Prefers a moist soil with a pH between 6.5 and 7.5[200]. Plants are hardy to about -30°c[200]. Plants have a deep and penetrating root system and can be invasive. If grown in the garden they are best kept in bounds by planting them in a large container which can be sunk into the ground[200].

## 6.2.519 *Mahoberberis aquisargentii*

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwsh hpa7tmwatli xre7t hjonli

drutta *Mahoberberis aquisargentii* is an evergreen Shrub growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from January to March. The species is

the rock garden[1]. The flowers have a delicious almond-like perfume[245].

## 6.2.436 *Aster tripolium*

Sea Aster

5 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.9 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwshom hpa7tmwatli fyixre7t hjonli

drutta *Aster tripolium* is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflyflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - the somewhat fleshy leaves are used to make pickles or are cooked[2, 105, 177]. A sweet taste[179]. The stem contains about 8.4% ash, whilst the leaf is 9% ash - this is mainly sodium chloride[179].

tcanta None known  
dwatta OphthalmicOphthalmic[100].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. This species tends to be a short-lived perennial[17]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 6.2.437 *Ophrys sphegodes*

Early Spider Orchid

5 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwssliip hpa7tmwatli xre7t hjonli

drutta *Ophrys sphegodes* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the

embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Plants prefer a shady position[188]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Plants are rather sparingly visited by bees, setting seed only if visited[17]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

## 6.2.438 *Thymus praecox*

Mother of thyme, Creeping thyme, Woolly Thyme

5 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 0.1 m hkuc  
htut cyutli hgtakyuuctup hwicli hrasjlut hpa7tli flatprikliwsh hpa7tmwatli xre7t hjonli

drutta *Thymus praecox* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentThe leaves are used as a food flavouring[177, 238]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialCan be used as a ground cover plant in a sunny position[188]. The essential oil obtained from the leaves is used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are

large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

**nwatta** Landscape Uses:Border, Container, Ground cover, Rock garden. Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Grows well between stepping stones on paths, tolerating light treading[183, 200]. Succeeds on walls. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -15°C[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[1]. There are some named varieties selected for culinary and ornamental purposes[183, 200]. Special Features:Attractive foliage, Edible, Fragrant foliage.

### 6.2.439 Thuja plicata

Western Red Cedar, Giant Arborvitae, Giant Cedar, Incense Cedar, Western Red Cedar

5 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 60 m hkuc hmimhtut cyutli tcuphja 7n hwicli hrasjlutnyikfrip hpa7tli flatprklwisslip hpa7tmwatli hjonli

drutta Thuja plicata is an evergreen Tree growing to 60 m (196ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from March to April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

**kcaak** Edible Parts: Inner barkEdible Uses: GumInner bark - fresh or dried[2, 105, 161]. The inner bark can be dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread. A pitch obtained from the trunk has been used as a chewing gum[257].

**tcanta** Baby care Basketry Brush Dye Fibre Fuel Fungicide Gum Hair Hedge Hedge Insulation Paper Roofing Scourer Shelterbelt Stuffing Thatching Tinder Wick Wood-Tolerant of light trimming and of reasonable exposure, this species can be grown as a hedge or as part of a shelterbelt[75]. An infusion of the boughs can be used as a hair wash to treat dandruff and scalp germs[257]. The fibrous inner bark can be pounded until it is soft and then used as a sponge for scouring dishes etc, or can be used for making rough clothing, blankets, mats, ropes, sanitary towels, a padding in a baby's cradle, nappies etc. Waterproof hats, capes, trousers, skirts etc can be made from the inner bark[257]. It is also used in thatching and as a stuffing material for mattresses[46, 61, 82, 99, 118, 171, 226, 257]. Inner bark strips have been used as a roofing material[257]. The bark has also been used to make paint brushes[257]. The inner bark has been used to make a wick for oil lamps[257]. The inner bark has been used for making baskets[257]. The roots are used in basket making, making nets etc[99]. The roots have been used in coiled and imbricated baskets[257]. The roots have been peeled, split and used to make coiled watertight baskets that can be used for boiling water[257]. The roots are harvested in the spring or early autumn when it is easier to remove the bark. The outer strips of the roots are used to make the bottom of the basket, the centre core is used in the coils and the root bark, because of its toughness, is used to make the edges[257]. The fibrous bark is used for roofing and the sides of shelters. It is also used as an insulation[61,

99]. A fibre obtained from the bark is used in making paper. The fibre is about 3.8mm long (this refers to the heartwood fibre, the inner bark fibre is probably longer)[189]. Branches can be harvested at any time of the year, they are cut into usable pieces and pre-soaked in clear water prior to cooking. They are then cooked for six hours or more with lye. It is difficult to rinse it to clear water because it seems to be a dye material[189]. The fibre is then hand pounded with mallets, or put through a blender or a ball mill for six hours. It is difficult to hydrate properly. The resulting paper is a rich deep brown/red[189]. The slender pliable branches are used as a high quality rope[257]. They are gathered in spring, peeled and, if thick, are split into halves or quarters. They are then twisted and worked until soft and pliable and finally woven together to make the rope[99]. A green dye can be obtained from the leaves and twigs[257]. The inner bark can be used as a tinder[257]. Wood - aromatic, light, soft, straight-grained, not strong, very resistant to decay. This resistance to decay is probably due to the existence of powerful fungicides in the wood[226]. The wood from fallen trees remains sound for at least 100 years[226]. It is pale to dark red in colour[226]. The wood was widely utilized by many native North American Indian tribes who used it for making a wide range of items including canoes, houses, totem poles, bowls, spoons, ladles and tools[226, 257]. It is currently used in making greenhouses[1, 11, 82, 171]. The wood is not of such good quality when grown in mild humid areas[1]. It makes a good fuel, burning with very little smoke, though it burns quickly[99].

**dwatta** Abortifacient Analgesic Antidandruff Antirheumatic Astringent Emmenagogue Febrifuge Kidney Odontalgic Pectoral Poultice Skin Stomachic TB VDWestern red cedar was employed medicinally by a number of native North American Indian tribes, who used it to treat a wide range of complaints[257]. It is seldom, if ever, used in modern herbalism. An infusion of the leaves has been used in the treatment of stomach pains and diarrhoea[257]. A decoction of the leaves has been used in the treatment of colds[257]. A decoction of the powdered leaves has been used externally to treat various internal pains, including rheumatism[257]. The leaf buds have been chewed in the treatment of toothaches and sore lungs[257]. A decoction of the buds has been used as a gargle[257]. A decoction of the small branches has been used in the treatment of coughs, colds and tuberculosis[257]. A weak infusion has been drunk in the treatment of painful joints caused by rheumatism or arthritis[257]. A poultice of the crushed bough tips and oil has been applied to the back and chest in the treatment of bronchitis, rheumatism, stomach pains and swollen neck[257]. An infusion of the twigs has been used as a wash in the treatment of venereal disease sores[257]. A decoction of the boughs has been used as an antidandruff shampoo[257]. A decoction of the stem tips and the roots has been used in the treatment of colds[257]. An infusion of the bark and twigs has been used in the treatment of kidney complaints[257]. An infusion of the seeds and twigs has been used in the treatment of fevers[257]. The chewed bark, or a decoction of the bark, has been drunk to induce menstruation[257]. A moxa of the inner bark has been used as a counter-irritant for the skin[257]. A poultice of the inner bark has been applied to carbuncles[257]. The bark has been pounded until it is as soft as cotton and then used to rub the face[257]. The very soft bark has been used to bind wounds and cover dressings[257]. The shredded bark has been used to cauterize sores and swellings[257].

**propta** Seed - best sown when ripe in the autumn in a cold frame[113]. Stored seed germinates best if given a short cold stratification[113]. It can be sown in a cold frame in late winter. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If growing large quantities of plants, the seed can be sown in an outdoor seed bed in mid spring[78]. Grow the plants on for two years and then plant them out into their permanent positions in late autumn or early spring. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a shaded frame. Forms roots by the end of September but it should be overwintered in a frame[78]. Cuttings of almost ripe wood, 5 - 10cm with a heel, September in a cold frame. Forms roots in the following summer. Plant out in autumn or spring[78].

**nwatta** Landscape Uses:Pest tolerant, Screen, Speci-

kcaak Edible Parts: LeavesEdible Uses: Young leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

**tcanta** None known

**dwatta** None known

**propta** Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

**nwatta** Prefers a deep moist soil with its roots in the shade. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk. Succeeds in acid as well as alkaline soils[200]. A twining plant[182]. The leaf-stalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants flower on the current season's new shoots. They can usually be left unpruned, though weak or dead shoots can be removed and main shoots can be cut back by up to two thirds of their length if they are outgrowing their allotted area[273]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 6.2.513 Deutzia scabra

Fuzzy pride-of-rochester, Deutzia

5 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwisslip hpa7tmwatli xre7t hjonli

drutta Deutzia scabra is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaak** Edible Parts: LeavesEdible Uses: Young leaves - cooked. A famine food, it is only used when all else fails[105, 177].

**tcanta** Nails WoodWood - fine grained. Used for mosaic and wooden nails[46, 61].

**dwatta** None known

**propta** Seed - sown February in a greenhouse and only just cover the seed[78, 175]. Germination is usually good, taking 1 - 3 months at 18°C[78, 175]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts[78]. Cuttings of half-ripe wood, 10 - 12cm with a heel, end of June to July in a frame[11, 78]. Good to high percentage[78]. Cuttings of ripe wood, 20 - 25cm with a heel, either in an outdoor bed if it is sheltered enough, otherwise in a cold greenhouse[78].

**nwatta** Landscape Uses:Border, Foundation, Massing, Standard, Specimen. An easily grown plant, it tolerates most soils but prefers a moist well-drained fertile humus-rich soil with shade from the early morning sun when grown in areas with late frosts[11, 200]. Prefers a sunny sheltered position, it can be grown on a woodland edge[184]. Tolerates a limey soil[11]. Dormant plants are hardy to about -20°C[184]. The young growth, however, is subject to damage by late frosts and so a suitable position with shelter from early morning

spring sunshine is best. A very ornamental plant[1], it is the best and most reliable species in this genus for growing in Britain[11]. A number of cultivars have been developed for their ornamental value[182]. Flowers are produced on the previous seasons wood[182]. Flowering can be increased by thinning the old shoots after flowering[188]. A very polymorphic plant[58]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Blooms are very showy.

### 6.2.514 Senecio nemorensis fuchsii

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hyihshrasjlutnyikfrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Senecio nemorensis fuchsii is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcaak** Edible Parts: StemEdible Uses: Young stems - pickled[177]. Some caution is advised, see the notes above on toxicity.

**tcanta** None known

**dwatta** None known

**propta** Seed - sown spring in a greenhouse and only just cover the seed. Make sure the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer if they have grown sufficiently. Otherwise, grow them on in the greenhouse or cold frame for their first winter and plant them out the following year after the last expected frosts. Division in spring[200]. Root cuttings in early spring[200].

**nwatta** Succeeds in a sunny position in most well-drained moderately fertile soils[200]. This sub-species is the form that is used for food in Asia[177].

### 6.2.515 Berberis sherriffii

5 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 2 m hkuc hmimhtut cyutli kyuctup hwicli hyihshrasjlutnyikfrip hpa7tli flatprklwis hpa7tmwatli fyifxre7t hjonli

drutta Berberis sherriffii is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcaak** Edible Parts: FruitEdible Uses: Fruit - raw or cooked.

**tcanta** DyeA yellow dye is obtained from the root.

**dwatta** Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

**propta** Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature



months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season's growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Succeeds in an open loamy soil[1], preferring a well-drained humus-rich soil in full sun[200]. Tolerates poor soils and atmospheric pollution[200]. Plants are hardy to at least -10 to -15°C if they are sheltered from cold winds[200]. This species is closely related to *E. sieboldianus*[200].

### 6.2.509 Viburnum corylifolium

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum corylifolium is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The ovoid fruit is about 8mm long and contains a single large seed[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It dislikes chalky soils[1]. Prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200].

### 6.2.510 Rubus coreanus

Korean Bramble

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Rubus coreanus is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium

(loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. Small with a poor flavour[11]. The dark red or purplish black fruit is 5–8 mm in diameter[266].

tcanta DyeA purple to dull blue dye is obtained from the fruit[168].

dwatta Aphrodisiac Astringent Ophthalmic Restorative Tonic UrinaryThe fruit is aphrodisiac, astringent, restorative and tonic[176, 218, 238]. It is taken internally in the treatment of complaints associated with disturbed liver and kidney functions, such as back pain, urinary dysfunction, premature greying, blurred vision, infertility, impotence and premature ejaculation[238, 279]. The fruit is harvested when fully ripe and can be used fresh or dried[238]. The juice of the bruised leaves or a decoction of the root are used in the treatment of ophthalmia[218]. The seed is astringent and tonic[218].

propta Seed - requires stratification and is best sown in early autumn in a cold frame. Stored seed requires one month stratification at about 3°C and is best sown as early as possible in the year. Prick out the seedlings when they are large enough to handle and grow on in a cold frame. Plant them out into their permanent positions in late spring of the following year. Division of the suckers in early spring or just before leaf-fall in the autumn[200].

nwatta Easily grown in a good well-drained loamy soil in sun or semi-shade[1, 11, 200]. Plants are rarely cultivated for their edible fruit in Japan[58]. This species is a raspberry with biennial stems, it produces a number of new stems each year from the perennial rootstock, these stems fruit in their second year and then die[200]. Plants in this genus are notably susceptible to honey fungus[200].

### 6.2.511 Grewia biloba parviflora

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Grewia biloba parviflora is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit. No more details. The fruit is about 10mm in diameter[200].

tcanta None known
dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering.

nwatta Succeeds in most soils[200]. One report says that this species is not very hardy in Britain, preferring hotter summers than are usually experienced here[11]. Another report, however, says that it is hardy to about -30°C[200].

### 6.2.512 Clematis pierotii

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Clematis pierotii is a deciduous Climber growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

men. Prefers a moist loamy soil[1, 81]. Dislikes dry soils[11]. Not suitable for light sandy soils because it is shallow rooting[75], but it succeeds on most other soil types, even on waterlogged soils and heavy clays[81, 200]. Succeeds in chalky soils[200]. Prefers some shelter from the wind according to some reports[1, 81] whilst others say that it is fairly wind resistant[11, 75]. Trees tolerate salt winds[75] but not severe maritime exposure[K]. The wood and foliage are highly aromatic[226]. The foliage has a strong fruity smell, like pear-drops or crushed apples[185]. A fast growing tree, it often puts out new growth of 1 metre a year and can average 60cm a year for the first 40 years. Increase in girth can also be rapid, 5cm a year for the first 60 years has been recorded[185]. Sometimes planted for forestry in Britain[17], it is at its best in the moister western half of the country[11, 185]. There are many named varieties selected for their ornamental value[188]. Tolerant of light trimming, so long as this is not back into old wood, plants also retain their lower branches unless these are shaded out by neighbouring plants[11]. The foliage turns bronze in cold weather[81]. Trees are notably susceptible to honey fungus[81, 200]. Special Features: North American native, Inconspicuous flowers or blooms.

### 6.2.440 Tsuga chinensis

Chinese Hemlock

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 45 m hkuc

pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli hjonli

drutta Tsuga chinensis is an evergreen Tree growing to 45 m (147ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower in April, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Inner barkEdible Uses: Tealnmner bark - raw or dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[2, 46, 161]. A herbal tea is made from the young shoot tips[2, 62, 95, 159, 183]. These tips are also an ingredient of 'spruce beer'[183].

tcanta Dye Hedge Hedge Resin Tannin WoodApart from the report about the use of the wood, all the other uses listed below are based on the uses that T. canadensis is put to and a note in [46] that this species has similar uses. Yields a resin similar to Abies balsamea, it is gathered by incisions in the trunk or by boiling the wood[46, 61, 64]. The bark contains 8 - 14% tannin[46, 171]. The inner bark is used according to one report[82]. A brown dye is obtained from the bark[21, 46]. A pitch (called hemlock pitch), is obtained by distillation of the young branches[46]. Tolerant of light trimming, plants can be grown as a hedge[81]. This species does not make a good hedge in Britain[200]. Wood - soft, durable. Used for shingles[82]. The timber is used for construction, aircraft, furniture, and in mines[266].

dwatta Astringent Diaphoretic DiureticThe bark is astringent, diaphoretic and diuretic[21]. A tea made from the inner bark or twigs is helpful in the treatment of kidney or bladder problems, and also makes a good enema for treating diarrhoea[21]. It can also be used as a gargle or mouthwash for mouth and throat problems or externally to wash sores and ulcers[21]. The powdered bark can be put into shoes for tender or sweaty feet or for foot odour[21].

propta Seed - it germinates better if given a short cold stratification[80, 113] and so is best sown in a cold frame in autumn to late winter. It can also be sown in early spring, though it might not germinate until after the next winter. If there is sufficient seed, an outdoor sowing can be made in spring[78]. Pot-grown seedlings are best potted up into individual pots once they are large enough to handle - grow them on in a cold frame and plant them out in early summer of the following year. Trees transplant well when they are up to 80cm tall, but they are best put in their final positions when they are about 30 - 45 cm or less tall, this is usually when they

are about 5 - 8 years old[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

nwatta An easily grown plant, it thrives best when growing in a deep well-drained soil in the western parts of Britain where it appreciates the higher rainfall[11]. However, it succeeds in most soils and positions, being especially good on acidic sandy soils[81] but also tolerating some lime[11] so long as there is plenty of humus in the soil[208]. Plants are very shade tolerant when young, but need more sunlight as they grow older[81, 200]. Plants are thin and poor when grown in dry or exposed places[200]. A very slow growing tree in most of Britain but probably faster in the far west and in Ireland[185]. Plants require hot humid summers and do not usually thrive in Britain[200]. Plants are very liable to injury by late frosts[1], they are often shrubby in cultivation[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.441 Ulmus wallichiana

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 35 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Ulmus wallichiana is a deciduous Tree growing to 35 m (114ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked.

tcanta Dye Fibre String WoodA strong fibre is obtained from the inner bark. It is used for cordage, slow matches and sandals[146, 158]. The young shoots are used to make strong ropes[145]. A dye is obtained from the ashes of the burnt twigs[145]. The colour is not given. Wood - fairly hard, somewhat scented, fine grained, takes a good polish. Used for furniture[146, 158].

dwatta SkinSkin[145].

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Prefers a fertile soil in full sun[188], but is easily grown in any soil of at least moderate quality so long as it is well drained[1]. Susceptible to 'Dutch elm disease' according to one report[200], whilst another says that it might be resistant[11]. This disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200].

### 6.2.442 Pterocarya rhoifolia

Japanese Wingnut

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 30 m hkuc

htut cyutli tcup hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Pterocarya rhoifolia* is a deciduous Tree growing to 30 m (98ft 5in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed[105]. No more details are given but the seed is very small and would be very fiddly to use.

tcanta WoodWood - light, soft, not easily cracked. Used for clogs, chopsticks etc.

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[80, 113]. Pre-soak stored seed for 24 hours in warm water[80] then cold stratify for 2 - 3 months[98, 113]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer of the following year[240]. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature shoots, November in a frame. Only use vigorous shoots[113]. Layering. Division of suckers in the dormant season[188].

nwatta Prefers a sunny position in a rich strong loam with abundant moisture at the roots[11, 200]. Succeeds in areas that do not experience prolonged winter temperatures below about -12˚c[200], but young plants and the young shoots of older trees can be cut back by winter frosts[11]. The leaves are aromatic when bruised[245]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.443 Cedrus libani

Cedar Of Lebanon

5 tin 8 cyuc 1 ckak 0 tcan 1 dwat 30 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli hjonli

drutta *Cedrus libani* is an evergreen Tree growing to 30 m (98ft) by 15 m (49ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from October to November, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: MannaEdible Uses: A manna is obtained from the tree[2, 105]. No more details were given in the report.

tcanta Essential Resin WoodAn oil similar to turpentine is obtained from the wood[46, 61]. An essential oil from the wood is used in perfumery[61]. Wood - moderately hard, durable. Used for construction[1, 46, 61]. The wood is extremely durable and retains its delightful fragrance for many years[245].

dwatta Antiseptic ExpectorantThe leaves and the wood are antiseptic and expectorant. They act to disinfect the respiratory tract[254].

propta Seed - collect the cones in winter and keep in a warm room until they open[1]. Sow immediately in a cold frame[78]. One report says that a short cold stratification of one month improves germination rates[113]. Keep the seed pot moist, but be careful because the young seedlings are very prone to damp off, keep them well ventilated[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a cold frame for their first winter and plant them out into their permanent positions in late spring or early summer. Give them some protection from winter cold for their first winter or two outdoors[K]. Cuttings of terminal shoots can be tried in a frame in November but they are very difficult[113].

nwatta Landscape Uses:Espalier, Pest tolerant, Specimen. Thrives on most soils, being very tolerant of chalk, dry sites and of drought when it is established[11, 81, 200]. Prefers a rich loam or a sandy clay in full sun[1]. Succeeds in

warm dry areas with less than 40cm of rain a year, but also in areas with cool summers and up to 200cm of rain[200]. Very intolerant of atmospheric pollution[11, 81]. Small trees less than 50cm tall establish much quicker and better than taller trees, those more than 2 metres tall are difficult to establish[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Fairly slow growing, trees rarely average more than 30cm increase in height per year[185]. Trees can be very long lived, to 300 years or more[185]. There are several named varieties selected for their ornamental value[188]. Small male cones are formed on the lower branches of trees, whilst the larger female cones are formed on higher branches[238]. These female cones persist on the tree for 2 - 3 years before breaking up[238]. Trees are notably susceptible to honey fungus[81, 200]. The trees have a broad canopy and tend to hold any falling snow. This can lead to branches being broken by the weight of snow[81]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 6.2.444 Ailanthus altissima

Tree Of Heaven

5 tin 8 cyuc 1 ckak 5 tcan 3 dwat 25 m hkuc hmimhtut cyutli hgatkyuctcuphja7n hwicli hyhshrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Ailanthus altissima* is a deciduous Tree growing to 25 m (82ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant is not wind tolerant. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105]. Used as an emergency food in times of scarcity, they have an offensive odour[2, 177, 178]. Some caution is advised, see the notes above on toxicity.

tcanta Dye Hedge Hedge Herbicide Insecticide Repellent Soil reclamation Soil stabilization Tannin WoodA yellow dye is obtained from the leaves[7]. The leaves contain 12% tannin, quercetin, as well as isoquercetin, and the alkaloid linuthine[218, 269]. The leaves and wood are high in cellulose and are used in paper-making[7, 74]. The crushed leaves and flowers are insect-repellent[14]. The plant parts, when steeped in water, are said to yield an insecticidal solution[218, 269]. An aqueous extract of the leaves contains a substance that is toxic to other tree seedlings[240]. When plants are put into marshy areas they drain the soil and thereby remove mosquito breeding sites[254]. The plants have extensive root systems and sucker freely, they can be used in soil-stabilization programmes[149]. Since the plant is tolerant of soil pollution it can also be used in land reclamation schemes on old mine tips etc[200]. Plants can be grown as a tall hedge[14]. Wood - fairly hard, heavy, difficult to split, not durable, coarse grained. Though little used, except in poorer countries, the wood is suitable for cabinetry, cellulose manufacture, furniture, lumber, pulp, and woodwork. It is difficult to split but easy to work and polish. The wood is also used locally for charcoal and firewood[4, 46, 149, 178, 269]. Yields of 20 cubic metres per hectare is possible for this light wood[269].

dwatta Anthelmintic Antibacterial Anticonvulsant Antidiarrhoeal Antispasmodic Astringent Bitter Cardiac Deobstruent Diuretic Dysentery Emetic Emmenagogue Epilepsy Febrifuge Malaria RubefacientThe tree of heaven is not often used in Western herbal medicine, though it is more popular in the Orient. Various parts of the plant are used, though the bark is the part most commonly used - however, it contains a glycoside that has not been fully researched and so should be used with caution[7]. The root and stem bark are antispasmodic, astringent, bitter, cardiac depressant, diuretic, emetic, febrifuge, rubefacient and vermifuge[4, 61, 147, 176, 178, 218, 238]. The vermifuge properties do not act on round

tcanta WoodThe wood is hard and heavy, suitable for making furniture and other small articles[266].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn. Stored seed will probably require stratification and should be sown as early in the year as possible[78]. Germination is usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in a frame[200]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[11, 78]. They take about 2 months to root and should be overwintered in a greenhouse, planting out in late spring[78]. Fair to good percentage[78]. Cuttings of almost ripe side shoots, 7 - 12cm with a heel, October/November in a cold frame[78]. Lift the following autumn and plant in their permanent positions[78]. Layering in autumn. Partially sever the layer about 12 months later and lift in the following spring. High percentage[200].

nwatta Requires a well-drained fertile soil in a sheltered position in sun or light shade[1, 200]. Prefers a warm soil that is not too heavy or close[11]. Dislikes calcareous soils[11, 182, 200]. Plants are susceptible to fire-blight[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.506 Bryonia dioica

Red Bryony, Cretan bryony

5 tin 9 cyuc 1 ckak 0 tcan 2 dwat 3.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli priklwis hpa7tmwatli nyanhjen hjonli

drutta *Bryonia dioica* is a PERENNIAL CLIMBER growing to 3.5 m (11ft) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - must be cooked[2, 105]. They are eaten in spring. Caution is advised in the use of this plant, see the notes above regarding toxicity.

tcanta None known

dwatta Cathartic Cytotoxic Diaphoretic Expectorant Hydrogogue Irritant Pectoral Purgative VermifugeA powerful cathartic and purgative, bryony is used with great caution in present-day herbalism[254]. It is primarily prescribed for painful rheumatic conditions[254]. The root is cathartic, cytotoxic, diaphoretic, expectorant, hydrogogue, irritant, pectoral, purgative and vermifuge[4, 9, 19, 21, 46, 165]. It is used in small quantities internally in the treatment of various inflammatory conditions, bronchial complaints, asthma, intestinal ulcers, hypertension and arthritis[238]. Externally, it is applied as a rubefacient to muscular and joint pains and pleurisy[238]. The root, which can be 75cm long and 75mm thick[268], can be used fresh at any time of the year[7], it can also be harvested in the autumn and be dried for later use[4]. This plant should be used with great caution and only under the supervision of a qualified practitioner. See the notes above on toxicity. The whole herb has an antiviral effect[254].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring.

nwatta A rapid grower, it is of easy cultivation succeeding in most soils that are well drained[1], avoiding acid soils

in the wild[17]. Prefers a sunny position[238]. A very deep-rooted climbing plant[7], attaching itself to other plants by means of tendrils[4]. The plant is not eaten by rabbits[17]. Plants can be easily encouraged by scattering ripe seed along the base of hedgerows[200]. Dioecious, male and female plants must be grown if seed is required[200].

### 6.2.507 Spiraea henryi

5 tin 9 cyuc 1 ckak 0 tcan 0 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Spiraea henryi* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the leaves[177].

tcanta None known

dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed as soon as it is ripe in a cold frame if possible. It is likely to require stratification before it germinates, so stored seed should be sown in a cold frame as early in the year as you receive it. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a light sandy soil a frame. Cuttings of mature wood of the current seasons growth, 15cm long, October/November in an outdoor frame[200]. Another report says that September is a good time to do this[119]. Division of suckers in early spring[200]. They can be planted out straight into their permanent positions.

nwatta Tolerates most soils[200], but prefers a good loamy soil, abundant moisture and full sunlight[11, 200]. Hybridizes freely with other members of this genus[11]. A very ornamental plant[1], it is closely related to *S. wilsonii*. [182] and to *S. canescens*[11].

### 6.2.508 Eleutherococcus gracylistylus

Wu Jia Pi

5 tin 9 cyuc 1 ckak 0 tcan 3 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hyhshrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta *Eleutherococcus gracylistylus* is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: FlowersEdible Uses: Flowers[177]. No more details are given.

tcanta MiscellanyNone known

dwatta Antibacterial Antirheumatic Diuretic MiscellanyThe leafy shoots are tonic and are also believed to alleviate internal injuries by dispelling blood[218]. The root bark is antibacterial, antirheumatic and diuretic[176]. It is used in the treatment of arthritis, backache and a host of other ailments. A medicinal wine made from it is commonly on sale in China[218]. A decoction of the stem bark or the roots is used in the treatment of rheumatoid arthritis, aches and pains in the back and legs, open sores on the scrotum, beriberi and traumatic injuries[147]. The plant is aphrodisiac, nutritive and tonic[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3

kcakta Edible Parts: RootEdible Uses: Young root - boiled[74].

tcanta AdhesiveA glue is made from the roots[74].  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. Sow stored seed in a greenhouse as soon as it is obtained. Germination is slow and could take 1 - 12 months at 15°C. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow on for their first winter in a greenhouse. Plant out into their permanent positions in late spring after the last expected frosts. Do not plant deeply in the soil, the crown of the plant should be slightly exposed[245]. Division after the plant dies down in late summer. Great care must be taken because the plants resent root disturbance[200]. Only divide the plants when it is really necessary, and no more frequently than once every 6 years, being careful not to break the brittle roots[245]. It is probably best to pot up the divisions and grow them on in the greenhouse until they are established.

nwatta Prefers a very well drained, very rich, light sandy loam in a warm sunny sheltered position[90, 200]. A covering of sharp sand helps the plant to survive wet winters. Plants can also be mulched overwinter with organic matter in the autumn in order to give them extra protection, but this mulch must be removed in the spring otherwise it might encourage the new growth to rot[200]. Some protection should be given to the young shoots in spring in areas subject to late frosts[200]. Keep plants dry in summer after they have flowered[90]. A very ornamental plant[1] and a good bee plant[74]. Plants resent root disturbance and so should be placed in their final positions as soon as possible[200]. Plants require some cold stratification in winter in order to flower well in the following summer[200]. Slugs are very attracted to this plant so some protection must be given.

### 6.2.503 Clematis serratifolia

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkc  
hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprik-  
wisslip hpa7tmwatli xre7t hjonli

drutta Clematis serratifolia is a deciduous Climber growing to 3 m (9ft 10in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from August to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[105, 177]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Flowers are produced on the current season's growth, any pruning is best carried out in spring[219]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm

deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 6.2.504 Viburnum furcatum

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3.5 m hkc  
hmim cyuti tcup hwicli hrasjlutnyik hpa7tli frusflatprik  
hpa7tmwatli dyatxre7t hjonli

drutta Viburnum furcatum is a deciduous Shrub growing to 3.5 m (11ft 6in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acidic soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177].

tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter; it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It requires a lime-free soil, preferring a deep rich loamy soil in a shady position[1, 11]. Requires woodland conditions but without competition from other plants[11]. Best if given shade from the early morning sun in spring[200]. A very hardy plant, tolerating temperatures down to about -25°C[184]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. This species is closely related to *V. lantanoides*[11, 184].

### 6.2.505 Photinia parvifolia

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkc  
hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta Photinia parvifolia is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit. No more details are given[177]. The fruit is about 10mm in diameter[200].

worms or earthworms[269]. A nauseatingly bitter herb, it is used internally to treat malaria and fevers, it also slows the heart rate and relaxes spasms[238]. It needs to be used under the supervision of a qualified practitioner since the bark readily causes vomiting[238]. In China, the bark is a popular remedy for dysentery and other complaints of the bowels[4]. In one clinical trial, 81 out of 82 patients were cured of dysentery when they were given this herb[254]. A tincture of the root-bark has been used successfully in the treatment of cardiac palpitations, asthma and epilepsy[4]. Tree-of-heaven is a folk remedy for asthma, cancer, diarrhoea, dysentery, dysmenorrhoea, dysuria, ejaculation (premature), epilepsy, eruption, fever, gonorrhoea, haematochezia, leucorrhoea, malaria, metrorrhagia, sores, spasms, spermatorrhoea, stomachic, tumours of the breast (China), and wet dreams[269] The bark is harvested in the spring and dried for later use[7]. The leaves, bark of the trunk, and roots are put into a wash to treat parasitic ulcers, itch, and eruptions[269]. In Korea, the root bark is used in the treatment of coughs, gastric and intestinal upsets[269]. The stem bark is emmenagogue[218]. The leaves are anthelmintic, astringent and deobstruent[218]. The fruit is used in the treatment of bloody stools and dysentery[218, 269]. They have also been used to treat ophthalmic diseases[269]. Extracts from the plant are bactericidal[218]. The tree is used in homeopathic remedies for cancer[269]. A resin extracted from the roots and leaves is a revulsive or vesicant[269].

propta Seed - best sown outdoors as soon as it is ripe[78]. If you only have a small quantity of seed it will probably be better to sow it in a cold frame. The germination can be poor[80], averaging about 56%[98], though one kilo of seed will normally produce in the region of 6,500 usable plants[269]. The seed germinates best if given a short cold stratification of 8 weeks[80, 113]. The seed is not usually produced in Britain[80]. Prick out the seedlings into individual pots when they are large enough to handle, keep them in a cold frame for their first winter and plant them out in late spring[K]. Root cuttings in December[113]. Suckers, planted out in late winter.

nwatta Landscape Uses:Pest tolerant, Aggressive surface roots possible. A very tough and easily grown tree, succeeding under most conditions, the Tree of Heaven is resistant to most diseases and is also reported to be tolerant of alkalinity, drought, frost, heat, high pH, hydrogen fluoride, low pH, pollution, SO<sub>2</sub>, poor, dry or wet soils, heavily polluted soils and industrial pollution[200, 269]. The plant prefers a light moist soil and a sheltered position[1, 133]. Prefers a position in full sun or partial shade[238]. The tree is estimated to tolerate an annual precipitation of 30 to 250cm (tolerating a dry season up to 8 months), an annual average temperature of 10° to 20°C, and a pH of 5.5 to 8.0. Growing on the smallest of city plots and rubbish heaps, this species obviously can tolerate a wide array of soils, from acid to alkaline, sand to light clay, well-drained to swampy, poor to rich. It is said to do poorly on chalky soils or compact clay[269]. Plants are hardy to at least -15°C[200]. A very ornamental tree, it has a somewhat tropical appearance and is fast growing when young[1, 7, 14], though it is rather short-lived[229]. The trees send up suckers freely and soon form dense thickets[7, 200, 229]. The plant has become a noxious weed in parts of Australia and is rather weed-like in many other countries[238, 269]. The roots are rather aggressive and can cause damage to drainage systems[226]. The plants thrive even when growing in very polluted cities[11, 229] and so have been used as street trees and as shade-trees in parks[268], they do not do well in the north of Britain, however[98]. Male flowers are malodorous and have potentially allergenic pollen[80, 200]. The crushed leaves are also malodorous[226]. The large leaves have glandular teeth near their base and these release a pungent aroma when pressed[245]. The disagreeable odour of the plant may cause some people to feel sleepy[269]. This tree is occasionally cultivated for its wood[149]. This is brittle however, and branches are very liable to break off in the wind[200]. Trees coppice readily[200]. The leaves were once used as a food for silkworms[2], but were found to be unsuitable[7]. This species is notably resistant to honey fungus[88, 200]. Dioecious. Male and female plants must be grown if seed is required[269]. Special Features:Not North American native, Invasive, Attractive flowers or blooms.

### 6.2.445 Fraxinus angustifolia

Narrow-Leaved Ash

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 25 m hkc  
htut cyuti kyucup hwicli hrasjlutnyik hpa7tli flatprik-  
wisslip hpa7tmwatli xre7t hjonli

drutta Fraxinus angustifolia is a deciduous Tree growing to 25 m (82ft) by 12 m (39ft). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Edible Uses: CondimentThe fruit is used as a condiment[177, 183].

tcanta None known  
dwatta None known

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. Quite cold-hardy when dormant, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species is closely related to *F. excelsior*[11]. A very ornamental tree[1], there are several named forms, selected for their ornamental value[200]. This species might be dioecious, in which case male and female plants must be grown if seed is required.

### 6.2.446 Zelkova serrata

Japanese Zelkova, Saw Leaf Zelkova

5 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 25 m hkc  
hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprik-  
lwis hpa7tmwatli hjonli

drutta Zelkova serrata is a deciduous Tree growing to 25 m (82ft) by 10 m (32ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 171].

tcanta WoodWood - tough, hard, beautifully grained. Used for tool handles, construction, furniture etc[46, 61, 151].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Stored seed requires stratification and should be sown as early in the year as possible[78, 200]. Germination rates are variable[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Landscape Uses:Pest tolerant, Aggressive surface roots possible, Specimen, Street tree. An easily grown plant, it succeeds in almost any good soil, acid or alkaline, preferring a deep well-drained moist loam[11, 200]. Prefers a moderately sheltered position[11]. Relatively shade tolerant[200]. A fast growing tree[200]. Dormant plants are very cold-tolerant, but they are sometimes damaged by late spring frosts when they are young[11]. Plants are susceptible to Dutch Elm Disease, but the beetle that is the vector of this disease rarely feeds on *Zelkova* so infestation is rare[11, 200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 6.2.447 Sorbus japonica

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Sorbus japonica* is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is up to 13mm across[200] and is produced in bunches which makes harvesting easier[K].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188].

### 6.2.448 Carya aquatica

Water Hickory  
5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 20 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyif hjonli

drutta *Carya aquatica* is a deciduous Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from June to October, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked. Astringent[177]. The seed is up to 35mm long, it is produced in clusters of 3 - 4 and has a thin shell, but the kernel is very bitter[11, 82, 229]. The seed ripens in late autumn and, when stored in its shell in a cool place, will keep for at least 6 months[K].

tcanta Fuel WoodWood - heavy and close grained but soft and brittle, which limits its use[229, 235]. It weighs 46lb per cubic foot and is used mainly in fencing and as a fuel, where it yields considerably more heat than most woods[229, 235].

dwatta None known  
propta Seed - requires a period of cold stratification. It is best sown in a cold frame as soon as it is ripe[78].

Stored seed should be kept moist (but not wet) prior to sowing and should be sown in a cold frame as soon as possible[78]. Where possible, sow 1 or 2 seeds only in each deep pot and thin to the best seedling. If you need to transplant the seedlings, then do this as soon as they are large enough to handle, once more using deep pots to accommodate the tap root. Put the plants into their permanent positions as soon as possible, preferably in their first summer, and give them some protection from the cold for at least the first winter[78, K]. Seed can also be sown in situ so long as protection is given from mice etc and the seed is given some protection from cold[200] (a plastic bottle with the top and bottom removed and a wire mesh top fitted to keep the mice out is ideal)

nwatta Prefers a deep moisture-retentive loam in a sunny sheltered position, requiring a good summer for best development[1, 63, 137, 200]. A slow growing tree[200], it does not begin bearing seed until more than 20 years old[229]. Most species in this genus have quite a wide range of distribution and, in order to find trees more suited to this country, seed from the most appropriate provenances should be sought[137]. Most trees growing in Britain at present tend to only produce good seed after hot summers[137]. *Carya aquatica* hybridizes with *C. illinoensis* (C. × *lecontei* Little) and is reported to hybridize with the tetraploid C. texana [C. × *ludoviciana* (Ashe) Little][270]. Plants are strongly tap-rooted and should be planted in their permanent positions as soon as possible[1, 137]. Sowing in situ would be the best method so long as the seed could be protected from mice[1, 200]. Trees are late coming into leaf (usually late May to June) and lose their leaves early in the autumn (usually in October)[137]. During this time they cast a heavy shade. These factors combine to make the trees eminently suitable for a mixed woodland planting with shrubs and other trees beneath them[137]. Plants in this genus are notably resistant to honey fungus[200]. Trees are self-fertile but larger crops of better quality seeds are produced if cross-pollination takes place[229].

### 6.2.449 Calocedrus decurrens

Incense Cedar, California Incense Cedar  
5 tin 8 cyuc 1 kcaak 0 tcan 1 dwat 15 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Calocedrus decurrens* is an evergreen Tree growing to 15 m (49ft) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe dense leaflets have been used as a flavouring and protection when leaching acorns[257].

tcanta Basketry Broom Containers Miscellany WoodThe boughs and twigs have been used to make brooms[257]. The roots have been used as overlay twine warps and overlay twine weft bases in making baskets[257]. The bark has been made into baskets[257]. Wood - soft, light, close grained, very durable in the soil though it is often damaged by dry rot[82]. It has a powerful, incense-like fragrance[245] and is used for making shingles, lathes, fencing, pencils, construction etc[46, 61, 81, 171]. Mature trees are often infected by dry rot, so they are not considered to be a major timber species[229].

dwatta Miscellany StomachicA decoction of the leaves has been used to treat stomach troubles[257]. Steam from an infusion of the leaves has been inhaled in the treatment of colds[257].

propta Seed - sow early spring in a greenhouse[245]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for their first winter. Plant them out in late spring or early summer, after the last expected frosts and consider giving them some protection from the cold for their first winter outdoors. Cuttings of the current season's

order to produce fruit and fertile seed[11, 200]. Special Features:Attractive foliage, Not North American native, Blooms are very showy.

### 6.2.499 Vaccinium elliottii

Elliott's blueberry  
5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Vaccinium elliottii* is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The fruit is about 8mm in diameter[200].  
tcanta None known  
dwatta None known  
propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.500 Euonymus sachalinensis

Euonymus  
5 tin 8 cyuc 1 kcaak 0 tcan 0 dwat 3.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Euonymus sachalinensis* is a deciduous Shrub growing to 3.5 m (11ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - boiled[105, 177]. Some caution is advised, see the notes above regarding possible toxicity.

tcanta WeavingThe white inner bark is used in making string shoes[151].

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[121]. Stored seed requires 3 months cold stratification, so should be sown as early in the year as possible in a cold frame[113]. The seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 7cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Landscape Uses:Massing, Screen. Thriving in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[11]. A plant in an open position at Cambridge Botanical Gardens was 2 metres tall and laden with fruit in September 1989[K]. This species is often confused with *E. planipes*[121]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 6.2.501 Cotoneaster franchetii

Orange cotoneaster  
5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc pcmimimhtut cyutli kyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta *Cotoneaster franchetii* is an evergreen Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta The fruit has a mild flavour though it is very mealy and full of seeds[K].

tcanta Dye Hedge HedgeA rose-tan dye is obtained from the fruit[168]. The plant can be grown as an informal wind-break hedge in all but the most exposed situations[29, 75, 200]. Tolerates trimming[75].

dwatta None known  
propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°C and then 3 months cold stratification at 4°C[164]. The seed usually germinates within 1 - 18 months at 15°C but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

nwatta An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Plants also succeed in deep shade[219]. Tolerates atmospheric pollution[200]. Fairly tolerant of maritime exposure[75, 200]. Plants are hardy to about -15°C[184]. Hybridizes freely with other members of this genus[200]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Trees are notably susceptible to honey fungus[200].

### 6.2.502 Eremurus robustus

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Eremurus robustus* is a PERENNIAL growing to 3 m (9ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

## 6.2.496 Bryonia alba

White Bryony

5 tlin 9 cyuc 1 kcaok 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli prikrlwis hpa7tmwatli hjonli

drutta Bryonia alba is a PERENNIAL CLIMBER growing to 4 m (13ft 1in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: One report says that the young shoots are edible[2], though caution is advised[K]. See the notes above on toxicity. The starch of the root is a famine food for extending bread flour after removing the acrid element. The young shoots are eaten. Caution: It is probably very poisonous [1b].

tcanta None known

dwatta Antirheumatic Homeopathy UrinaryThe root is cathartic, hydrogogue, irritant, pectoral and purgative[4]. The root is harvested in the autumn and can be used either fresh or dried[4]. It should be used with great caution, see notes above on toxicity. The fresh root, gathered before the plant comes into flower, is made into a homeopathic remedy[232]. This is used in the treatment of a wide range of complaints[232]. It is said to be one of the best diuretics and an excellent remedy for gravel as well as all other obstructions and disorders of the urinary passage[4].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring.

nwatta A rapid grower, it is of easy cultivation succeeding in most soils that are well drained[1], avoiding acid soils in the wild[17]. A climbing plant, attaching itself to other plants by means of tendrils[4]. Plants can be easily encouraged by scattering ripe seed at the base of hedgerows[200]. Plants in the north of their range are monoecious, but those growing in the south are dioecious[200]. Where necessary, male and female plants must be grown if seed is required.

## 6.2.497 Salix aegyptiaca

5 tlin 9 cyuc 1 kcaok 2 tcan 2 dwat 4 m hkuc htut cyutli tucphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix aegyptiaca is a deciduous Shrub growing to 4 m (13ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from January to February. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers Inner bark LeavesEdible Uses: Drinkinner bark - raw or cooked. It can be dried, ground into a powder and added to cereal flours for use in making bread etc. A famine food, it is only used when all else fails[172]. Young shoots - cooked. They are not very palatable[172]. Male catkins - sugared[11, 177]. A perfumed drink is made from the catkins[11].

tcanta Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current

year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Closely related to *S. cinerea*[1]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.498 Viburnum plicatum

Japanese Snowball, Japanese Snowball Viburnum, Doublefile Viburnum

5 tlin 8 cyuc 1 kcaok 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli dyakre7t hjonli

drutta Viburnum plicatum is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from June to July, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked. Young leaves - cooked[177]. Rather unpleasant[K].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Massing, Screen, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. A very hardy plant, tolerating temperatures down to about -25°C. Plants are surface-rooting and are very susceptible to damage by hoeing, drought or water-logging. A section of top growth will often die back if the roots are damaged, in severe cases this will lead to the death of the plant[202]. A very ornamental plant, there are many named varieties[182, 202]. The type species is actually a sterile garden form. The true wild species is often referred to as *V. plicatum tomentosum*. (Thunb.)Miq. Plants take about 5 years from planting out before they produce fruit[202]. Fruit production can be erratic[202]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in

growth, taken in mid autumn, in a light sandy soil in a cold frame[245].

nwatta Landscape Uses:Pest tolerant, Screen, Specimen. Succeeds in full sun in a moist well-drained soil that is neutral to acid, though it will also survive on dry alkaline soils[200]. Plants are shade tolerant when young[200]. It grows best in a position that is sheltered from strong winds[245]. Trees are slow growing but long-lived in the wild, with specimens up to 1000 years old recorded[229]. They grow slowly in Britain, but they are perfectly hardy[11]. Young trees can grow 60cm in a year but they seldom average more than 30cm[185]. Growth virtually stops once the tree reaches 25 metres tall[185]. All parts of the plant are strongly aromatic[188, 245]. This species is strongly resistant to honey fungus[81, 188]. The tree exhibits very different crown habits dependant upon the area in which it is being grown[185, 200]. At one time these different habits were considered to be different sub-species, but it is recognised now that it is only climatic forces that cause the differences. Special Features: North American native, Fragrant foliage, Inconspicuous flowers or blooms.

## 6.2.450 Thuja orientalis

Biota

5 tlin 9 cyuc 1 kcaok 0 tcan 3 dwat 15 m hkuc hmimhtut cyutli hgatkyuctcp hwicli hrasjlutnyik hpa7tli flatprikwsslip hpa7tmwatli hjonli

drutta Thuja orientalis is an evergreen Tree growing to 15 m (49ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: Seed - after removing the bitterness[105, 179]. No more details are given, but the bitterness in seeds is usually removed either by leaching them in water or by thoroughly cooking them[K].

tcanta Dye Hedge Hedge Parasiticide WoodTolerant of regular trimming, though not into old wood, it can be grown as a dense hedge[149]. A yellow dye is obtained from the young branches[4]. Wood - durable in the soil, moderately hard, close grained, rather coarse grained, light, soft, brittle. Used for construction, cabinet making, cooperage[4, 146, 149, 227].

dwatta Antiasthmatic Antibacterial Antipyretic Antitussive Aperient Astringent Diuretic Dysentery Emmenagogue Emollient Expectorant Haemostatic Lenitive Parasiticide Sedative Skin StomachicThis plant is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. Both the leaves and the seeds contain an essential oil consisting of borneol, bornyl acetate, thujone, camphor and sesquiterpenes[283]. The leaves also contain rhodoxanthin, amentoflavone, quercetin, myricetin, carotene, xanthophyll and ascorbic acid[283]. The leaves are antibacterial, antipyretic, antitussive, astringent, diuretic, emmenagogue, emollient, expectorant, febrifuge, haemostatic, refrigerant and stomachic[147, 176, 218, 238]. Their use is said to improve the growth of hair[147, 176, 238]. They are used internally in the treatment of coughs, haemorrhages, excessive menstruation, bronchitis, asthma, skin infections, mumps, bacterial dysentery, arthritic pain and premature baldness[238]. The leaves are harvested for use as required and can be used fresh or dried[238]. This remedy should not be prescribed to pregnant women[238]. The seed is aperient, lenitive and sedative[147, 176, 218]. It is used internally in the treatment of palpitations, insomnia, nervous disorders and constipation in the elderly[238]. The root bark is used in the treatment of burns and scalds[216]. The stems are used in the treatment of coughs, colds, dysentery, rheumatism and parasitic skin diseases[218].

propta Seed - best sown when ripe in the autumn in a cold frame. Stored seed germinates best if given a short cold stratification. It can then be sown in a cold frame in late winter. Plants make very little growth in their first year[78].

When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If there is sufficient seed it is worthwhile trying a sowing in an outdoor seed bed in April[78]. Grow the plants on for at least two years before planting them out in the winter. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a shaded frame. Forms roots by the end of September but should be overwintered in a frame[78]. Cuttings of almost ripe wood, 5 - 10cm with a heel, September in a cold frame. Forms roots in the following summer. Plant out in autumn or spring[78].

nwatta Prefers a moist loamy soil[149]. Grows best on dry freely draining sites, often alkaline in reaction[200]. Does well over old building rubble[200]. Tolerant of dry dusty sites and of atmospheric pollution in towns[81]. Prefers a sunny sheltered position[238]. Easily transplanted[149]. There are many named varieties selected for their ornamental value. Produces seed freely in cultivation[200]. A slow growing tree, it does not really thrive in Britain[11], especially in the western part of the country[200]. The best specimens are to be found in towns or cities such as Oxford and very sharply drained soils in gardens[185]. Plants cannot regenerate from old wood. Pruning is not normally necessary for this species, any pruning that is carried out should be done with care[238]. Plants are susceptible to attacks by honey fungus[238]. Plants are monoecious, male catkins being produced at the tips of branches and female cones at the base[283].

## 6.2.451 Schizophragma hydrangeoid

Japanese Hydrangea Vine

5 tlin 8 cyuc 1 kcaok 0 tcan 0 dwat 12 m hkuc pcimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikrlwis hpa7tmwatli xre7t hjonli

drutta Schizophragma hydrangeoides is a deciduous Climber growing to 12 m (39ft) by 12 m (39ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 177].

tcanta Plants can be allowed to sprawl and are then used as a ground cover for a shady position[188, 208].

dwatta None known

propta Seed - sow late winter to early spring in a greenhouse. Germination is usually fair to very good[78]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in light shade in the greenhouse for their first winter, planting them out in late spring or early summer. Layering in spring directly into pots. A fair to good percentage[78], though it can be difficult to find suitable low growth[202]. Cuttings of half-ripe wood, 4 - 5cm with a heel, July in a frame[1, 78]. Keep the cuttings moist[78].

nwatta Landscape Uses:Arbor. Requires a moist leafy soil and some shade at the roots. An easily grown plant[1], it prefers a good loamy soil and plenty of moisture[11]. Succeeds on most soil types, disliking only very alkaline soils[202]. Plants succeed in sun or shade[182], though they prefer full sun[202, 219]. In the hotter parts of Britain they prefer shade from the midday sun[219]. They succeed on north-facing walls[188, 219]. The fully dormant plant is hardy to about -20°C[182, 200]. Plants are slow to establish and slow-growing when young, though they speed up somewhat with age[202]. Plants do not normally require pruning, though any unwanted growth can be removed in the winter[219]. Plants have a similar growth habit to ivy (*Hedera helix*) climbing trees by means of aerial roots or growing along the woodland floor[1, 182]. Plants might need some help to become attached in their early years[182]. Some named varieties have been developed for their ornamental value[182]. Special Features:Not North American native, Attractive flowers or blooms.

## 6.2.452 Pterostyrax corymbosa

Epaulette Tree

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Pterostyrax corymbosa is a deciduous Tree growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. A famine food, it is only used when all else fails[179].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 3 months cold stratification at 5°C[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in the late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[200]. Layering[200].

nwatta Requires a good loamy soil and a sunny position[1]. Requires a deep acid soil in sun or semi-shade[200]. A fast-growing tree[200]. Often confused with *P. hispida*[1]. Flowers are most abundantly produced on wood that was well-ripened the previous summer[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.453 Melittis melissophyllum

Bastard Balm

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Melittis melissophyllum is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, moths. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA coumarin scented (like new-mown hay) herb, it is occasionally used for making a 'Maiwein' or 'Maibowle' type of beverage[183].

tcanta None known

dwatta Astringent Blood purifier Diuretic Emmenagogue Sedative VulneraryAstringent, blood purifier, diuretic, emmenagogue, sedative, vulnerary[61].

propta Seed - best sown in a cold frame in the autumn[188]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring[200] or autumn[188]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any good soil in partial shade[1, 187]. Prefers a rich loam[1]. Grows well in thickets, woodland edges and the garden border[1]. Plants are hardy to about -20°C[187]. The flowers have a pleasing sweet honey-like scent[245]. The leaves become sweetly fragrant as they dry[245], they retain their fragrance for a long time[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.454 Ligusticum mutellina

Mountain Lovage, Alpine lovage

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyixre7t hjonli

drutta Ligusticum mutellina is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male

and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaLeaves. Used as a parsley substitute[46, 61, 177]. The dried leaves are a tea substitute[46, 61].

tcanta None known

dwatta StomachicStomachic[46, 61].

propta The seed is best sown as soon as it is ripe in a cold frame in the autumn. Stored seed should be sown as early in the year as possible in a greenhouse or cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer if they have grown large enough. Otherwise, keep them in a cold frame for the first winter and plant them out in early summer. Division in spring.

nwatta Succeeds in any well-drained soil in a sunny position[200].

## 6.2.455 Salix x mollissima hippophaeifolia

5 tlin 9 cyuc 1 kcaak 3 tcan 2 dwat m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix x mollissima hippophaeifolia is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - cooked. Not very palatable[172].

tcanta BasketryThe stems are very flexible and are used in basket making[131]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. Succeeds in wet, ill-drained or intermittently flooded soils[1, 11]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. This is a hybrid species and it will not breed true from seed. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants are rarely bisexual[200], but they are usually dioecious and then male and female plants must be grown if seed is required.

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwissip hpa7tmwatli xre7t hjonli

drutta Clematis flammula is a deciduous Climber growing to 4 m (13ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from March to December, in flower from August to October, and the seeds ripen from October to January. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[1, K5, 177]. Some caution is advised due to reports of toxicity[K].

tcanta Plants can be grown as ground cover, planted about 1.2 metres apart and allowed to scramble over the ground[208].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Cuttings of half-ripe inter-nodal cuttings, June/July in a frame[202]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist well-drained soil with its roots in the shade[182, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. Thrives in exposed positions[182]. Plants are hardy to about -15°C[202]. A twining plant[182], it is fast growing[202]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A very ornamental plant[1], the flowers are very fragrant[202]. They have a pronounced smell of meadowsweet, almost too powerful when inhaled close-up[245]. They are produced on the current season's growth and so any pruning of the plant is best carried out in the spring before new growth begins[219]. Plants rarely produce fertile seed in Britain[219]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Plants seem to be immune to the predations of rabbits[233]. This species is notably resistant to honey fungus[88, 200].

## 6.2.494 Clematis patens

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Clematis patens is a deciduous Climber growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[105, 177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants do not generally require pruning, any dead, unwanted or weak shoots are best removed in the winter or early spring[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.495 Staphylea colchica

Bladdernut

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Staphylea colchica is a deciduous Shrub growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers OilEdible Uses: OilFlower buds[74]. No further details are given.

tcanta OilAn oil from the seed tastes like pistachio nuts but is purgative[74]. The report did not say if the oil had other uses.

dwatta PurgativePurgative[74].

propta Seed - this can be very slow to germinate, sometimes taking 18 months or more. It is best sown as soon as it is ripe in a cold frame[200], and some of it at least should then germinate in the spring. Stored seed should be sown as early in the year as possible and given cold stratification - it might not germinate until spring of the following year. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first winter. Plant them out early the following summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Fair to good percentage[78]. Layering in July/August. Takes 15 months. Good percentage[78].

nwatta Tolerant of a wide range of soils so long as they are not too dry[182, 200], it prefers a rich loamy soil in full sun or semi-shade[1, 11, 200]. Prefers a neutral to acid soil but tolerates some alkalinity[202]. A very ornamental plant, it is hardy to about -20°C[184]. Fairly fast-growing when young, but slowing with age[202]. Flowers best in years that follow hot summers[200]. Plants in this genus are notably resistant to honey fungus[200].



winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 15cm taken at a node, July/August in a frame. Plant out in autumn or spring. A very high percentage, they root within 3 weeks[78]. Cuttings of mature wood in a sheltered outdoor bed. Good percentage[78]. Layering in spring or summer. Plants often self-layer[K].

nwatta An easily grown plant, it succeeds in all soil types[202] but prefers a rich soil. Succeeds in limey soils. Grows well in heavy clay soils. It prefers a sunny position but succeeds in semi shade though it is apt to get leggy if grown in the shade of trees[182]. Succeeds against a north-facing wall[219]. Plants are hardy to about -25°c[184]. The flowers are produced quite early in the year and are frost-resistant[182]. Plants are medium to fast growing[202]. Flowers are produced on wood that is more than one year old[202]. Any pruning is best done after the plant has finished flowering[182]. A very ornamental plant, there are several named varieties[182]. This species is notably susceptible to honey fungus[200]. Special Features: Not North American native, Blooms are very showy. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 6.2.491 Clematis chinensis

Wei Ling Xian

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta Clematis chinensis is a deciduous Climber growing to 5 m (16ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoots - cooked[179]. They are said to be non-toxic in one report[179] but caution is still advised due to reports of toxicity in this genus[238]. It is quite probable that cooking destroys the acrimonious principle, though this is a plant that I have no desire to eat[K].

tcanta None known

dwatta Anodyne Antidote Antiperiodic Antirheumatic Antispasmodic Antitumor Cancer Carminative DiureticThe root is anodyne, antidote, antiperiodic, antispasmodic, carminative, diuretic and sedative[147, 176, 178, 218, 238]. A decoction is taken internally in the treatment of rheumatism and arthritis, tetanus and cold-type stomach-ache[147, 238]. The root is harvested in the autumn and dried for later use[238]. The whole plant is antirheumatic[147, 176, 178, 218]. The plant has a history of folk use in the treatment of cancer[147, 176, 178, 218]. The root contains anemonin, this has antibacterial, analgesic, sedative and antispasmodic actions. It also inhibits the heart and central nervous system and is rubefacient[176].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°c[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade and its shoots growing up to the light[164]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11].

Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A twining plant[182]. The leaf-stalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants flower in the autumn on the current season's growth, any pruning is best carried out in the spring before new growth begins[219, 238]. The flowers are produced quite late in the season and can be damaged by late frosts, so plants generally do better in the milder western parts of the country[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. The flowers are often damaged by winter cold[11].

### 6.2.492 Viburnum cylindricum

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli dyatxre7t hjonli

drutta Viburnum cylindricum is an evergreen Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Oil OilEdible Uses: Oil OilAn edible oil is obtained from the seed[105, 146, 158, 179]. It is used for cooking[272].

tcanta Oil Oil WoodAn oil from the seed is used as a luminant[146]. Wood - hard, close grained[146, 158].

dwatta SkinThe oil from the seed is used to soothe itchy skin[272].

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, succeeding in most soils but ill-adapted for poor soils and dry situations[11]. Prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. The flowers are sweetly scented[245].

### 6.2.493 Clematis flammula

Fragrant Virgin's Bower, Fragrant clematis  
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc

### 6.2.456 Aconitum violaceum

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Aconitum violaceum is a PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[177]. It is eaten as a pleasant tonic[240]. These reports should be treated with great distrust due to the poisonous nature of the genus[K].

tcanta None known

dwatta Antidote Antiinflammatory FebrifugeThe entire plant is used in Tibetan medicine, it is said to have a bitter taste and a cooling potency[241]. Antidote, anti-inflammatory and febrifuge, it is used in the treatment of snake and scorpion bites, contagious infections and inflammation of the intestines[241].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by the native range of the plant it should succeed outdoors in many parts of the country. It is a polymorphic species[51]. The following notes are based on the general needs of the genus. Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

### 6.2.457 Leucocrinum montanum

Sand Lily, Common starlily

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli lwisslip hpa7tmwatli xre7t hjonli

drutta Leucocrinum montanum is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[105, 161, 257]. No more details are given.

tcanta None known

dwatta PoulitceA poultice of the pulverized roots has been applied to sores and swellings[257].

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse as soon as it is ripe if possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Requires a sunny position in a well-drained but moisture-retentive alkaline soil[200]. Tolerates temperatures down to about -20°c[200].

### 6.2.458 Daphniphyllum macropodium

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Daphniphyllum macropodium is an evergreen Shrub growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. A 'New Year's green'[177]. (This quite possibly relates to the Chinese new year which begins in February)

tcanta WoodWood - soft, close and even grained, very handsome. Used for turnery, carving etc[146]. The wood of the roots is especially handsome, it is deep red in colour[158].

dwatta None known

propta Seed - sow spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of moderately ripened wood, 7 - 10cm with a heel or at a junction with old wood, July in individual pots in a frame. The cuttings are slow to root, give them brisk bottom heat[78]. Fair percentage[78]. Layering of current seasons growth, 12cm long in August/September. Takes 12 - 18 months. High percentage[78].

nwatta Succeeds in any good soil, tolerating lime but perhaps not suitable for very chalky soils[11]. A useful plant for moist shady positions[11]. Dislikes cold drying winds. A very ornamental plant[1], it is hardy to about -20°c[184]. Plants have withstood 30° of frost at Kew Gardens, but prefer shelter[11]. Very closely related to D. himalense and possibly no more than a sub-species of that species[11]. The flowers have a pungent aroma[182]. They are produced in racemes on the previous year's wood[11]. Dioecious, male and female plants must be grown if seed is required.

### 6.2.459 Chelidonium majus

Greater Celandine, Swallow Wort, Greater Celandine

5 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat m hkuc pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyfexre7t hjonli

drutta Chelidonium majus is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves OilEdible Uses: OilLeaves - cooked in small quantities[177]. They contain small amounts of toxic alkaloids[179]. The leaves are boiled with clean earth, the mixture is left overnight and then thoroughly washed in several changes of water[179]. Very much a famine food, to be used when all else fails!![K].

tcanta OilPlants rapidly form a ground cover, but should only be used in wild places because of their invasive nature[200]. Seed contains 50 - 66% of a fatty oil[74]. No more details given.

dwatta Acid Alterative Anodyne Antispasmodic Cancer Cholagogue Diaphoretic Diuretic Hydrogogue Narcotic Ophthalmic Purgative Stomachic WartsGreater celandine has a long history of herbal use[4]. Traditionally it was employed as an ophthalmic to treat and clear the eyesight whilst in

modern herbal medicine it is used more as a mild sedative, antispasmodic and detoxifying herb, relaxing the muscles of the bronchial tubes, intestines and other organs[254]. The latex is much used externally to treat warts. Caution should be employed, especially when the plant is used internally however, because it contains toxic alkaloids[7, 21]. The leaves and the sap are acrid, alterative, anodyne, antispasmodic, caustic, cholagogue, diaphoretic, diuretic, hydrogogue, narcotic, purgative[4, 7, 9, 21, 46, 165, 238]. They are used in the treatment of bronchitis, whooping cough, asthma, jaundice, gallstones and gallbladder pains[254]. The plant is harvested in the spring as it comes into flower; it is best used fresh[7], but can also be dried for later use[9]. The roots can also be used, these are harvested in the autumn and dried for later use[9]. The plant has anticancer properties and is analgesic[4, 218]. It is an important component of a stomach ulcer drug[218]. The plant has an abundant acrid bright-orange sap that stains the skin strongly and is powerfully irritant[4]. It is used as an external treatment to get rid of warts, ringworm and corns[13, 187, 222, 244] and has also been used to remove films from the cornea of the eye[4]. The plant contains the alkaloid chelidonium, which is similar to the alkaloid papaverine found in poppies. This alkaloid has antispasmodic and sedative effects on the bile ducts and bronchi. However, results have been inconsistent, especially if the preparation is not fresh[244]. The plant also contains the alkaloid sparteine, which restores normal rhythm to feeble arrhythmic myocardia[207]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Chelidonium majus for liver and gallbladder complaints (see [302] for critics of commission E).

propta Seed - sow in situ February to May or August to November. Germination usually takes place within 1 - 12 months[164, 200]. The plant self-sows freely and should not need much encouragement. Division in March[111]. The plant bleeds profusely so this method is not recommended[200].

nwatta Landscape Uses:Woodland garden. Succeeds in any soil other than boggy conditions[1, 111, 233]. Prefers a rich soil of a woodland nature[1, 31]. Shade tolerant[31]. Plants grow well on walls if they are given a semi-shaded position and a pocket of soil into which to root[219]. A short-lived perennial[187], but it self-sows freely and can easily become a weed[200]. It quickly colonizes waste ground and thin woodland areas[233]. Once established, the plant is very difficult to eradicate. Special Features: North American native, Naturalizing, Attractive flowers or blooms.

## 6.2.460 Aconitum multifidum

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta Aconitum multifidum is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves[178]. No further details are given, apart from a claim that this species is not poisonous - a report that should be treated with extreme caution.

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A

greedy plant, inhibiting the growth of nearby species, especially legumes[54]. Considered to be a part of *A. napellus* by most botanists[1], it is probably *A. napellus vulgare*. (Rchb.)Rouy. and Foucaud[200]. We are keeping this record separate because the suggestion that this species is not poisonous[178] requires investigation.

## 6.2.461 Antirrhinum majus

Snapdragon, Garden snapdragon

5 tlin 10 cyuc 1 kcaak 2 tcan 1 dwat m hkuc hmimhtut cyutli kyuctup hwicli hyishrasjlutnykfrp hpa7tli flatprikkwis hpa7tmwatli fyfxkre7t hjonli

drutta Antirrhinum majus is a PERENNIAL growing to 1 m (3ft 3in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: OilEdible Uses: OilAn oil that is little inferior to olive oil is said to be obtained from the seeds[4]. The report also says that the plant has been cultivated in Russia for this purpose[4]. The seeds are very small and I wonder about the authenticity of this report[K].

tcanta Dye OilA green dye is obtained from the flowers, it does not require a mordant[168]. Dark green and gold can also be obtained if a mordant is used[168].

dwatta Antiphlogistic Bitter Resolvent StimulantThe leaves and flowers are antiphlogistic, bitter, resolvent and stimulant[7, 115]. They have been employed in poultices on tumours and ulcers[4]. It is effective in the treatment of all kinds of inflammation and is also used on haemorrhoids[7]. The plant is harvested in the summer when in flower and is dried for later use[7].

propta Seed - surface sow March in a greenhouse. The seed usually germinates in 10 - 21 days at 18°C[134]. Cool nights assist germination[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in situ in July/August and will produce larger and more floriferous plants the following summer. Cuttings of half-ripe wood in September in a cold frame[200].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Specimen, Woodland garden. Prefers a light well drained loam and a sunny position[1, 200]. Plants are tolerant of clay and lime soils, and also grow well on old walls[200]. Plants are often grown as an annual since they usually degenerate in their second year[1]. They often self sow when well-sited[K]. There are many named forms, selected for their ornamental value[200]. Special Features:Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers, Fragrant flowers.

## 6.2.462 Philadelphus microphyllus

Littleleaf Mock Orange

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli kyuctup hwicli hyishrasjlutnykfrp hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Philadelphus microphyllus is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[105, 161]. Formerly used as food[257]. No more details are given.

tcanta SoapThe leaves are rich in saponins, when crushed and mixed with water they produce a lather that is

## 6.2.488 Weigela coraeensis

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Weigela coraeensis is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Young leaves-cooked[105]. A famine food, they are only used when all else fails[177].

tcanta None known  
dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter or early spring. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Softwood basal cuttings, 10 - 12cm long, in a sandy soil in a cold frame in early summer[200]. Cuttings of half-ripe wood, 8 - 10 cm with a heel, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth. 20 cm long, November in a sheltered outdoor nursery bed[200].

nwatta An easily grown plant, succeeding in most fertile soils[11, 200]. Prefers a moist well-drained soil in sun or partial shade[200]. Tolerates atmospheric pollution[200]. Judging by the plants native range, it is likely to succeed in maritime exposure[K]. Plants are very floriferous and can exhaust themselves, literally flowering themselves to death. The flowers are borne in the leaf nodes of the previous years growth and any pruning is therefore best done as soon as the plant has finished flowering[182]. There are some named forms, selected for their ornamental value[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.489 Clematis terniflora

Sennin-So, Sweet autumn virginsbower, Sweet Autumn Clematis, Fall Clematis  
5 tlin 9 cyuc 1 kcaak 1 tcan 1 dwat 5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Clematis terniflora is a PERENNIAL CLIMBER growing to 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Young shoots - cooked[105, 177]. Parboiled, then eaten boiled or oil-roasted[183]. Some caution is advised, see the notes above on toxicity. The young buds (Does this refer to flower or leaf buds?) are parboiled then eaten boiled or oil-roasted, or they can be pickled in vinegar[183]. Flowers[105, 183]. No more details are given.

tcanta As an ornamental but can be invasive so plant with care. It's a vigorous climber.

dwatta Antidote Antiscrophulatic OphthalmicAntidote, antiscrofulatic, ophthalmic. Used in the treatment of corneal opacities[178].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame

for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Landscape Uses:Arbor, Ground cover, Specimen. Prefers a deep moist soil in a sunny position[200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. This species has the potential to spread from cultivation in areas where it has been introduced and could become problematic[274]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features:Attractive foliage, Not North American native, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms.

## 6.2.490 Forsythia suspensa

Lian Qiao, Weeping forsythia

5 tlin 8 cyuc 1 kcaak 3 tcan 3 dwat 5 m hkuc pcimhmimhtut cyutli tcup hwicli hrasjlutnykfrp hpa7tli flatprikkwisslip hpa7tmwatli dyatxre7t hjonli

drutta Forsythia suspensa is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: rutinYoung leaves - cooked[105, 177, 179]. Some caution is advised due to the presence of a glycoside[179]. The leaves are rich in rutin[218].

tcanta The sub-species *F. suspensa sieboldii* is a lax grower that roots freely where the branches touch the ground. It makes a very good tall ground cover when planted about 2.5 metres apart each way[208]. Landscape Uses: Border, Erosion control, Espalier, Massing, Screen.

dwatta Antidote Antiphlogistic Antitussive Cancer Diuretic Emmenagogue Febrifuge Laxative Tonic Urinary VermifugeLian Qiao has been used in Chinese herbalism for over 4,000 years and is considered to be one of the 50 fundamental herbs[218]. A bitter tasting pungent herb with an antiseptic effect, it is chiefly used to treat boils, carbuncles, mumps and infected neck glands[254]. The fruit is a bitter astringent herb that stimulates the heart, nervous system and gall bladder[238]. It contains vitamin P, which is used to strengthen capillaries[238]. The fruit is also antidote, antiphlogistic, antitussive, diuretic, emmenagogue, febrifuge, laxative and tonic[116, 147, 174, 176, 178, 218, 238]. It is used internally in the treatment of acute infectious diseases such as mumps, and also for tonsillitis, urinary tract infections allergic rashes etc[238]. The fruit is harvested when fully ripe and is dried for use in decoctions[238]. The plant has a similar action to *Lonicera japonica* and is usually used in combination with that species to achieve a stronger action[176]. The flowers have a broad-spectrum antibacterial action, inhibiting the growth of *Staphylococcus aureus*, *Shigella dysenteriae*, haemolytic streptococcus, *Pneumococcus*, *Bacillus typhi*, *Mycobacterium tuberculosis* etc[176]. The plant is vermifuge, though the part used is not stated[116, 147, 174, 178]. The leaves are febrifuge and are also poulticed onto ulcerated glands and haemorrhoids[218]. A decoction of the leaves and twigs is used in the treatment of breast cancer[61]. The root is used in the treatment of cancer, colds, fever and jaundice[182].

propta Seed - sow spring in a cold frame. The seed usually germinates within 2 months[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first

drutta *Acer acuminatum* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea substitute[183].

tcanta Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - compact, moderately hard. It is seldom used[158].

dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Good results are usually obtained.

nwatta Of easy cultivation, it prefers a good moist well-drained soil[1, 11] in a sunny position but tolerates some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. This species is often confused with *A. papilio*[11]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.486 Weigela decora

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Weigela decora* is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105]. They can be boiled with rice or millet[177].

tcanta None known  
dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter or early spring. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Softwood basal cuttings, 10 - 12cm long, in a sandy soil in a cold frame in early summer[200]. Cuttings of half-ripe wood, 8 - 10 cm with a heel, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth. 20 cm long, November in a sheltered outdoor nursery bed[200].

nwatta An easily grown plant, succeeding in most fertile soils[11, 200]. Prefers a moist well-drained soil in sun or partial shade[200]. Tolerates atmospheric pollution[200]. Plants are very floriferous and can exhaust themselves, literally flowering themselves to death. The flowers are borne

in the leaf nodes of the previous years growth and any pruning is therefore best done as soon as the plant has finished flowering[182]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.487 Cotinus coggygia

Smoke Tree, European smoketree, Venetian Sumac, Wig Tree, Smoke Tree  
5 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 5 m hkuc  
hmimhtut cyutli hgatkycutcup hwicli hyishrasjlitnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Cotinus coggygia* is a deciduous Shrub growing to 5 m (16ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to July, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves[2, 179]. They are possibly edible[105, 177]. Some caution is advised. A volatile oil in the leaves contains pinene and camphene[179]. One report suggests that the essential oil contained in the flowers and leaves has a mango-like odour[158]. We have tried these leaves and really would not recommend them to anyone[K].

tcanta Basketry Dye Essential Tannin WoodAn essential oil is obtained from the leaves and flowers[105]. It has a mango-like smell[158]. Is it edible[K]? A yellow to orange dye is obtained from the root and stem[1, 4, 11, 14, 57]. It is somewhat fugitive though[4]. The leaves and bark are a good source of tannins[46, 61, 158]. Wood - ornamental. Used for cabinet making, picture frames[158]. The twigs are used in basketry[158].

dwatta Cholagogoue Febrifuge OphthalmicThe wood is used as a cholagogoue, febrifuge and for eye ailments[218].

propta Seed - best sown as soon as it is ripe in a cold frame[78, 113, 200]. It should germinate in the spring. Slightly immature or 'green' seed, harvested when it has fully developed but before it dries on the plant, gives the best results[113]. Warm stratify stored seed for 2 - 3 months at 15°C, then cold stratify for 2 - 3 months[164]. Germination can be very slow, often taking 12 months or more at 15°C[164]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed has a long viability and should store for several years[113]. Cuttings of half-ripe wood, July/August in a frame[113]. Trench layering in spring[200].

nwatta Industrial Crop: Dye Industrial Crop: Tannin Management: Coppice Wild CropLandscape Uses:Border, Container, Massing, Pollard, Screen, Standard, Specimen. Tolerates most soils[202]. Prefers a well-drained dry or moist soil in a sunny position[108, 200], doing better in a soil that is not very rich[11, 49]. Prefers a fertile but not over-rich soil[188]. Tolerates light shade[188]. Established plants are drought tolerant. Plants are hardy to about -20°C[184], though die-back often occurs at the tips of shoots during the winter[202]. Plants are slow to establish but are then quite fast growing when young though they slow down with age[202]. Hybridizes with *C. obovatus*[182]. A number of cultivars have been developed for their ornamental value[182, 200]. The purple-leaved cultivars are susceptible to mildew[202]. Plants flower on wood that is at least 3 years old[202]. Any pruning is best done in the spring[202]. Branches sometimes wilt, especially after hard pruning, and these should be removed[182]. This species is notably resistant to honey fungus[88, 200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Not North American native, Attractive flowers or blooms.

an effective cleaner, used on the body, clothes etc[169]. You can wash your hands by merely picking a couple of leaves or a bunch of blossom, wetting your hands and then rubbing the plant material vigorously as if it was a bar of soap[K]. This soap is a very gentle cleaner that does not remove the body's natural oils, but does remove dirt. It is not very effective against oil[K].

dwatta None known  
propta Seed - best if given 1 months cold stratification[113]. Sow February in a light position in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long side-shoots, July/August in a shaded frame. Plant out in spring. High percentage[78]. Cuttings of mature wood of the current year's growth, 15 - 25cm with a heel, December in a sheltered bed outdoors. Fair to good percentage[78]. Layering in summer. Very easy.

nwatta Easily grown in any moderately fertile preferably dry soil[184], succeeding in thin soils over chalk and tolerating poor soils[200]. Grows well in heavy clay soils. Succeeds in semi-shade but prefers a position in full sun where it will flower more freely[182, 200]. Hardy to about -20°C[184]. Plants grow best in the east and south-east of Britain, they are shy to flower in gardens with cool summers[11]. Plants are very tolerant of pruning, one third of the stems can be cut down to the ground each year in order to promote fresh growth and heavier flowering[202]. A very ornamental plant[1] with aromatic flowers smelling of pineapples[182].

## 6.2.463 Pyrus serrulata

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli hgattcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Pyrus serrulata* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is about 1.5cm in diameter[200].

tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°C and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°C induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

nwatta Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to at least -15°C[200]. A very ornamental tree. This species is closely related to *P. serotina*, differing mainly in having smaller fruit[109].

## 6.2.464 Picrasma quassioides

Nigaki  
5 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Picrasma quassioides* is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Condition TeaFruit[105, 177]. Small and red[183]. The fruit is a berry about 7mm in diameter[200]. Young buds (the report does not say if they are flower or leaf buds) are used to make a tea[177, 179, 183]. A bitter substance called quassin' is extracted from (the bark of?) the tree and can be used as a hop substitute in brewing beer[183].

tcanta Insecticide Parasiticide WoodThe bark is used as an insecticide[46, 61]. Another report says that it is the wood that is used[240]. It is a substitute for the insecticide quassia, which is obtained from the wood of a tropical tree[240]. Quassia is a relatively safe organic insecticide that breaks down quickly and is of low toxicity to mammals. It has been used as a parasiticide to get rid of lice, fleas etc. Wood - hard, fine and close grained. Used for mosaic, utensils etc[46, 61, 158].

dwatta Anthelmintic Antiviral Bitter Febrifuge Hypotensive Parasiticide Stomachic TonicThe wood contains a number of medicinal compounds and has been shown to be anthelmintic, antiameobal, antiviral, bitter, hypotensive and stomachic[279]. It increases the flow of gastric juices[279]. It is used in Korea in the treatment of digestive problems, especially chronic dyspepsia[279]. A decoction of the stem bark is bitter, febrifuge and tonic[46, 61, 146, 158, 174, 218, 240, 272]. The leaves have been used to treat itchy skins[240, 272]. (Probably acting by killing body parasites[K].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 3 months cold stratification[113] and should be sown as early in the year as possible. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[200]. Root cuttings 4cm long in December. Plant them out horizontally in pots in a greenhouse[78].

nwatta Requires a fertile humus-rich moisture-retentive loam in a sunny position[200]. Plants also succeed when growing in semi-shade[188]. According to [200] this plant is only hardy to zone 10 (not tolerating frosts) but there are healthy trees in many parts of Britain including one 8.5 metres tall at Kew in 1981, one 8 metres tall seen growing in light woodland shade at Cambridge Botanical Gardens where it was bearing fruit in the autumn of 1996 and one 9 metres tall at Westonbirt in 1980[11, K].

## 6.2.465 Catalpa ovata

Chinese Catalpa  
5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 10 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Catalpa ovata* is a deciduous Tree growing to 10 m (32ft 10in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from July to August, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers SeedpodEdible Uses: Flowers and young pods - cooked[183]. They are boiled and washed[179]. (possibly in that order so as to remove any bitterness[K])

tcanta None known  
dwatta DiureticThe stems are diuretic (strongly)[174, 218].

propta Seed - best sown outdoors, or in a cold frame, as soon as it is ripe[200]. Stratify stored seed for 3 weeks at

1°C and sow in spring[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Softwood cuttings, 10cm long, in a frame. They should be taken in late spring to early summer before the leaves are fully developed[200]. Root cuttings in winter[200].

nwatta Landscape Uses:Specimen. Prefers a good moist loamy soil and a sunny position that is not exposed[1, 11]. Tolerates heavy clay soils. Very resistant to atmospheric pollution[188]. Plants are hardy to about -15°C, probably more in continental climates[200], they grow best in areas with hot summers[188]. Protect plants from late frosts when they are young[200]. Transplants easily[200]. The flowers are very fragrant[245]. The bruised foliage has an aromatic fragrance[245]. The flowers are considered to be one of the best bee plants in Japan[245]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Attractive flowers or blooms.

## 6.2.466 Gentiana macrophylla

Qin Jiao  
5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gentiana macrophylla is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[177]. An emergency food, used when all else fails.

tcanta None known  
dwatta Analgesic Antiinflammatory Antipyretic Antirheumatic HypotensiveQin Jiao has been used in Chinese herbalism for over 2,000 years and, like other members of this genus, the roots contain some of the most bitter compounds known and make an excellent tonic for the whole digestive system, working especially on the stomach, liver and gall bladder[238, 254]. The root is analgesic, anti-inflammatory, antipyretic, antirheumatic, diuretic, febrifuge, hypoglycaemic and hypotensive[176, 218, 238]. The root is used internally in the treatment of digestive problems, arthritis, allergic inflammations, low-grade fever in chronic diseases, jaundice and hepatitis[176, 218, 238, 254]. The root is harvested in the autumn and dried for later use.

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric

humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species requires a moist well-drained neutral to acid soil in a sheltered position[200, 238]. It prefers full sun but succeeds in partial shade[111]. Plants are hardy to at least -15°C[238]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. Plants are intolerant of root disturbance[200].

## 6.2.467 Phalaris minor

Small Canary Grass, Littleseed canarygrass  
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc  
htut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phalaris minor is a ANNUAL growing to 1.2 m (4ft) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in leaf from May to October, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Seed - cooked[257]. The seed can be ground into a flour and used in making bread, cakes etc. It is rather small and fiddly to utilize.

tcanta None known  
dwatta None known  
propta Seed - sow spring in situ[162].  
nwatta An easily grown plant, succeeding in an ordinary garden soil[1]. It is tolerant of most conditions, dry or wet[200].

## 6.2.468 Asclepias mexicana

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli kyuctcup hwicli hras hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Asclepias mexicana is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: Young blossoms - cooked[161, 177]. Some caution is advised, see the notes on toxicity at the top of the page.

tcanta LatexRubber can be made from latex contained in the leaves and the stems[112].

dwatta None known  
propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°C[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the

from the inner bark or twigs is helpful in the treatment of influenza, colds, kidney or bladder problems, and also makes a good enema for treating diarrhoea[21, 257]. It can also be used as a gargle or mouthwash for mouth and throat problems or externally to wash sores and ulcers[21]. The powdered bark can be put into shoes for tender or sweaty feet or for foot odour[21]. A poultice of the chewed leaves has been used to treat burns[257]. The warm gum obtained from the trunks has been used as a dressing on cuts[257].

propta Seed - it germinates better if given a short cold stratification[80, 113] and so is best sown in a cold frame in autumn to late winter. It can also be sown in early spring, though it might not germinate until after the next winter. If there is sufficient seed, an outdoor sowing can be made in spring[78]. Pot-grown seedlings are best potted up into individual pots once they are large enough to handle - grow them on in a cold frame and plant them out in early summer of the following year. Trees transplant well when they are up to 80cm tall, but they are best put in their final positions when they are about 30 - 45 cm or less tall, this is usually when they are about 5 - 8 years old[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

nwatta Landscape Uses:Hedge, Aggressive surface roots possible, Screen, Specimen, Woodland garden. An easily grown plant, it thrives best when growing in a deep well-drained soil in the western parts of Britain where it appreciates the higher rainfall[11]. However, it succeeds in most soils and positions, being especially good on acidic sandy soils[81]. Plants are very shade tolerant when young, but need more sunlight as they grow older[81, 200]. Plants are thin and poor when grown in dry or exposed places[200]. Dislikes atmospheric pollution[82]. A very ornamental plant[11], it is slow growing for the first few years, averaging 30cm a year, but older trees, especially in Scottish lowland sites in areas with cool moist summers, are growing rapidly[185]. Trees live 400 - 500 years in the wild[229]. They commence bearing seeds when about 20 - 30 years old, years of high production alternating with years of low production[229]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Inconspicuous flowers or blooms.

## 6.2.482 Euptelea pleiosperma

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 9 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Euptelea pleiosperma is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. A famine food, used when all else fails[179].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering.

nwatta Prefers an open moderately rich free soil[1] and full sun[200]. Grows well in an open situation in a woodland garden or shrub border[200].

## 6.2.483 Lonicera affinis

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 7 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lonicera affinis is an evergreen Climber growing to 7 m (23ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is

pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers FruitEdible Uses: Fruit[177]. No more details are given. The fruit is about 7mm in diameter[200]. Flowers. Used as a flavouring in drinks[177].

tcanta None known  
dwatta SkinA tea made from the flowers and leaves is used to treat rashes and boils[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 2 months cold stratification[113] and should be sown as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with or without a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with or without a heel, November in a cold frame. Good percentage[78]. Layering in autumn[200].

nwatta Prefers a good moist soil with its roots in the shade and its top growing into the light[200]. A climbing plant, supporting itself by twining around other plants[219].

## 6.2.484 Cornus occidentalis

Western Dogwood  
5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cornus occidentalis is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. They were often eaten by native North Americans, but they are bitter and acid[161, 257].

tcanta None known  
dwatta OphthalmicThe bitter-tasting bark is astringent, ophthalmic and tonic[118, 257]. An infusion has been used as a wash for sore eyes[257].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in poorly drained soils[200]. Succeeds in full sun or light shade[188]. Allied to *C. stolonifera* and considered to be part of that species by some botanists[11, 60, 200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.485 Acer acuminatum

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyikrip hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but is by no means fastidious, succeeding in thin, dry and shallow soils. Grows well in heavy clay soils. Plants are hardy to about -25°c[184]. Plants can be pruned back quite severely, they resprout well from the base[200]. This species is closely related to *B. poirietii*. *C.K.Schn.*, differing in its broader leaves and dark red fruits[200]. The range of this plant is often mistakenly given as the Caucasus, this is based on a misidentification[200]. Hybridizes freely with other members of this genus[1].

### 6.2.479 Sambucus microbotrys

Red Elder

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sambucus microbotrys is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers FruitEdible Uses: Flowers - raw or cooked. Fruit - raw or cooked[177, 257]. The fruit is about 4mm in diameter and is borne in large clusters[200]. Some caution is advised, see the notes above on toxicity.

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame, when it should germinate in early spring. Stored seed can be sown in the spring in a cold frame but will probably germinate better if it is given 2 months warm followed by 2 months cold stratification first[78, 98, 113]. Prick out the seedlings into individual pots when they are large enough to handle. If good growth is made, the young plants can be placed in their permanent positions during the early summer. Otherwise, either put them in a sheltered nursery bed, or keep them in their pots in a sheltered position and plant them out in spring of the following year. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings of mature wood of the current season's growth, 15 - 20cm with a heel, late autumn in a frame or a sheltered outdoor bed[78].

nwatta Tolerates most soils, including chalk[200], but prefers a moist loamy soil[11, 200]. Grows well in heavy clay soils. Tolerates some shade but is best in a sunny position[1]. Tolerates atmospheric pollution and coastal situations[200]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.480 Magnolia denudata

Lily Tree, Yulan Magnolia

5 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikl hpa7tmwatli xre7t hjonli

drutta Magnolia denudata is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from March to May, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Edible Uses: CondimentThe flowers, after the calyx has been removed, are pickled and used for flavouring rice[183].

tcanta None known

dwatta Anodyne Antifungal Astringent Carminative Cytotoxic Diaphoretic Hypotensive Sedative Tonic Uterine tonicTonic[177]. The flower buds and the seeds are carminative and diaphoretic[218]. The flower buds are antifungal, astringent, cytotoxic, hypotensive and a uterie stimulant[279]. They are used in Korea in the treatment of headaches, nasal obstruction and sinusitis[279]. They are picked in early spring, dried and then used in Chinese medicine to clear the nasal passages[177]. The plant is anodyne and sedative[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Border, Espalier, Firewood, Pest tolerant, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Succeeds in an acid or neutral peaty soil in sun or part shade[184]. Tolerates alkaline soils so long as they are deep and rich in humus[188]. The branches are brittle so a sheltered position is required[200]. Very tolerant of atmospheric pollution[200]. A very ornamental tree[1], it is hardy to about -20°c when dormant[184] but plants can be excited into early growth by mild winters and the flowers are then liable to be killed by frost[11]. The flowers, which begin to be produced when the plant is quite young, are deliciously scented[245]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. Special Features: Not North American native, Fragrant flowers, Blooms are very showy.

### 6.2.481 Tsuga mertensiana

Mountain Hemlock

5 tlin 7 cyuc 1 kcak 0 tcan 2 dwat m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatpriklwis hpa7tmwatli hjonli

drutta Tsuga mertensiana is an evergreen Tree growing to 45 m (147ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in leaf all year, in flower in April, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Inner barkEdible Uses: Tealner bark - raw or dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[161]. It is best used in the spring[172]. An emergency food, it is only used when all else fails[183]. A herbal tea is made from the young leaves and shoot tips[172, 183].

tcanta Dye Hedge Hedge Incense Pot-pourri Resin Tannin WoodThe slightly unripe cones are used in pot-pourri. They retain an attractive scent for several years[200]. Yields a resin similar to *Abies balsamea*, it is gathered by incisions in the trunk or by boiling the wood[46, 61, 64]. The bark contains 8 - 14% tannin[46, 171]. The inner bark is used according to one report[82]. A brown dye is obtained from the bark[21, 46]. The boughs are steamed or rubbed on furniture and used as a room deodorant and disinfectant[257]. A pitch (called hemlock pitch), is obtained by distillation of the young branches[46]. Tolerant of light trimming, plants can be grown as a tall hedge[29, 81]. Wood - strong[171]. Used for heavy construction[171]. Close-grained, light, soft and weak according to other reports, which go on to say that it is occasionally manufactured into lumber when other wood is not available[82, 229].

dwatta Astringent Diaphoretic Diuretic PouliticeThe bark is astringent, diaphoretic and diuretic[21]. A tea made

following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Prefers a well-drained light rich or peaty soil in a sunny position[1, 200]. Succeeds in poor soils. There is some confusion over nomenclature. *A. mexicana*. Rydb. is a synonym of *A. fascicularis* and the reports on the uses of this plant did not specify the authors name[60]. We have assumed that the uses refer to *A. mexicana*. Cav. There is also some confusion over the hardness of this plant with one report saying that it needs greenhouse protection in Britain[1] whilst another says that it is hardy to zone 6, or about -20°c[200]. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

### 6.2.469 Eremurus aucherianus

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat m hkuc htut cyutli hgatkuyctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Eremurus aucherianus is a PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[46, 61, 177].

tcanta AdhesiveA glue is made from the mucilage contained in the root and is used with leather and in book-binding[46, 61].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. Sow stored seed in a greenhouse as soon as it is obtained. Germination is slow and could take 1 - 12 months at 15°c. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow on for their first winter in a greenhouse. Plant out into their permanent positions in late spring after the last expected frosts. Do not plant deeply in the soil, the crown of the plant should be slightly exposed[245]. Division after the plant dies down in late summer. Great care must be taken because the plants resent root disturbance[200]. Only divide the plants when it is really necessary, and no more frequently than once every 6 years, being careful not to break the brittle roots[245]. It is probably best to pot up the divisions and grow them on in the greenhouse until they are established.

nwatta Prefers a very well drained, very rich, light sandy loam in a warm sunny sheltered position[90, 200]. A covering of sharp sand helps the plant to survive wet winters. Plants can also be mulched overwinter with organic matter in the autumn in order to give them extra protection, but this mulch must be removed in the spring otherwise it might encourage the new growth to rot[200]. Some protection should be given to the young shoots in spring in areas subject to late frosts[200]. Keep plants dry in summer after they have flowered[90]. Plants resent root disturbance and so should be placed in their final positions as soon as possible[200]. Plants require some cold stratification in winter in order to flower well in the following summer[200]. Slugs are very attracted to this plant so some protection must be given.

### 6.2.470 Matricaria matricarioides

Pineapple Weed

5 tlin 9 cyuc 1 kcak 0 tcan 2 dwat m hkuc htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Matricaria matricarioides* is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June

to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: TeaFlower heads - raw or cooked[172]. A tasty nibble[172]. The dried flowers are used to make herb teas[172]. They are pineapple scented when steeped in hot water[183].

tcanta RepellentThe plant repels insects[172]. The dried flowers are used as an insect repellent[213].

dwatta Antispasmodic Carminative Galactogogue Sedative Skin VermifugeThe flowering plant is antispasmodic, carminative, galactogogue, sedative, skin and vermifuge[9, 172, 222]. This plant is rarely used medicinally, though it is sometimes employed as a domestic remedy in the treatment of intestinal worms and also as a sedative[9]. The plant is harvested when in flower in the summer and is dried for later use[9]. Some caution is advised since some individuals are allergic to this plant[222].

propta Seed - sow spring or late summer in situ. Germination should take place within 3 weeks.

nwatta Succeeds in any well-drained soil in a sunny position[200]. The bruised or sun-warmed leaves emit the appealing odour of ripe apples[245].

### 6.2.471 Sorbus commixta

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sorbus commixta is a deciduous Tree growing to 10 m (32ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105]. About 7.5mm across[200], it is produced in fairly large bunches making harvesting easy[K]. Leaves - cooked. A famine food when all else fails[177]. The leaves may contain cyanogens so caution is advised.

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Dislikes dry soils[188]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. This species is suitable for street planting[200].

### 6.2.472 Phellodendron lavallei

Lavalle corktree

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 10 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Phellodendron lavallei is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown

if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: OilFruit[105, 177]. This use refers to the closely related *P. amurense*, it almost certainly applies to this tree as well[K]. The fruit is about 1cm in diameter and has a strong scent of turpentine, it is produced copiously in Britain[200].

tcanta Cork Dye Insecticide Oil WoodThe bark is thick and corky[200]. Can this be used as a source of cork[K]? The following uses are for the closely related *P. amurense*. They almost certainly also apply to this tree. A yellow dye is obtained from the inner bark[178]. An oil obtained from the seed has insecticidal properties similar to pyrethrum[57]. Wood - heavy, hard, strong, close grained. Used for furniture[74].

dwatta None known

propta Seed - best sown in the autumn in a cold frame[200]. Stored seed requires 2 months cold stratification, sow in late winter in a cold frame[78, 113]. Germination is usually good. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Pot up in autumn and over winter in a cold frame. Fair to good percentage[78]. Root cuttings - obtain in December and store in leafmold in a warm place for 3 weeks. Cut into 4cm lengths and plant horizontally in pots. Grow on in a warm greenhouse. Good percentage[78].

nwatta Prefers a moisture retentive well-drained deep rich loam in an open position in full sun[11, 200]. Grows best in areas with long hot summers[200]. Plants are gross feeders and require a rich soil if they are to perform well[11]. Dormant plants are hardy to at least -20°C, but the young growth is liable to damage from late spring frosts[11, 200]. This species is occasionally cultivated for timber in S.E. Europe[50]. Dioecious. Male and female plants must be grown if seed is required. The fruit is produced copiously on trees in Britain[200].

### 6.2.473 *Eriogonum microthecum*

Slender Buckwheat, Alpine slender buckwheat, San Bernardino buckwheat, Johnston's buckwheat, Panama 5 tin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Eriogonum microthecum* is an evergreen Shrub growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the plant[257].

tcanta None known

dwatta Diuretic Poulitce TBA decoction of the roots or tops has been used in the treatment of coughs caused by TB[61, 257]. A decoction of the stems and leaves has been used to treat bladder problems[257]. It has also been used externally in hot compresses or as a wash for lameness and rheumatism[257].

propta Seed - best sown as soon as it is ripe in the autumn in a sandy compost in a greenhouse. Sow stored seed in early spring in a warm greenhouse[1]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts. Division in early spring[1]. This has to be done with care because the plant resents root disturbance[200]. Try to obtain divisions from around the edges of the plants without digging up the whole clump. Tease the divisions out with as much root on them as possible and pot

them up. Grow them on in light shade in the greenhouse until they are rooting well and plant them out in the summer. Cuttings of greenwood with a heel in the summer[200].

nwatta Requires a loose lean gritty well-drained soil in a very sunny position[200]. Succeeds in dry soils. Tolerates exposed positions[200]. Requires some protection from winter wet[1]. A very variable plant, it has been divided into a number of varieties[270]. Established plants resent root disturbance[200].

### 6.2.474 *Chimonobambusa marmorea*

Kan-Chiku

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Chimonobambusa marmorea* is an evergreen Bamboo growing to 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Seed StemEdible Uses: Young shoots - cooked[177]. Seed - used as a cereal[177]. The seed is neither regularly nor abundantly produced.

tcanta Hedge HedgeThe plant is useful for low screens, clumps and hedges[195, 200].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings.

nwatta Prefers a good loamy soil[1]. Succeeds in most soils so long as they do not dry out[200]. Dislikes drought[1]. Prefers a position sheltered from cold north and east winds[1]. Plants are liable to injury by winter cold[11]. They are hardy to about -20°C according to another report[200]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. A few stems on each plant usually produce flowers in most years without noticeable harm to the plant[11]. Plants spread rapidly by means of underground suckers and are apt to be invasive, especially when they are well established[11, 200]. New canes are produced from late April.

### 6.2.475 *Filipendula multijuga*

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tucphja7n hwicli hrasjlutnyikrip hpa7tli prikliwis hpa7tmwatli fyixre7t hjonli

drutta *Filipendula multijuga* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Young shoot tips - cooked[116].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame[1].

The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a humus-rich moist soil in semi-shade[200]. Succeeds in full sun only if the soil is reliably moist throughout the growing season[200]. Dislikes dry or acid soils. Does well in marshy soils. Grows well in heavy clay soils. A very ornamental plant[116]. The flowers are very attractive to bees. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.476 *Ephedra major*

Ma Huang

5 tin 9 cyuc 1 kcaak 0 tcan 4 dwat m hkuc htut cyutli hgatkuyctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Ephedra major* is an evergreen Shrub growing to 2 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Fruit - raw.

tcanta None known

dwatta Antiasmatic Antidote Cardiac Diaphoretic Diuretic Febrifuge Nervine Pectoral Tonic Vasoconstrictor VasodilatorMembers of this genus contain various medicinally active alkaloids (but notably ephedrine) and they are widely used in preparations for the treatment of asthma and catarrh[238]. This species is the richest source of ephedrine in India, the stems containing over 2.5% total alkaloids, of which about 75% is ephedrine[240]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. The plant also has antiviral effects, particularly against influenza[238]. The stems are a pungent, bitter, warm herb that dilates the bronchial vessels whilst stimulating the heart and central nervous system[238]. The stems are also diaphoretic, diuretic, febrifuge, hypertensive, nervine, pectoral, tonic, vasoconstrictor and vasodilator[165, 176, 238]. They are used internally in the treatment of asthma, hay fever and allergic complaints[238]. They are also combined with a number of other herbs and used in treating a wide range of complaints[238]. This herb should be used with great caution, preferably under the supervision of a qualified practitioner[238]. It should not be prescribed to patients who are taking monoamine oxidase inhibitors, or suffering from high blood pressure, hyperthyroidism or glaucoma[238]. Ephedrine is seen as a performance-boosting herb and, as such, is a forbidden substance in many sporting events such as athletics[K]. The stems can be harvested at any time of the year and are dried for later use[238].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and

are also lime tolerant[200]. Dioecious, male and female plants must be grown if fruit and seed are required.

### 6.2.477 *Tulipa montana*

5 tin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Tulipa montana* is a BULB growing to 0.1 m (0ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. It can be dried, ground into a powder and then mixed with cereals when making bread etc[22, 46, 61, 74].

tcanta None known

dwatta None known

propta Seed - best sown in a shady part of the cold frame as soon as it is ripe in early summer[1], or in the early autumn[200]. A spring sowing of stored seed in the greenhouse also succeeds[K]. Sow the seed thinly so that the seedlings can be grown on without disturbance for their first growing season - apply liquid feeds to the pot if necessary. Divide the bulbs once the plants have become dormant, putting 3 - 4 bulbs in each pot. Grow the on in the greenhouse for at least the next year, planting them out when dormant. Division of offsets in July. Larger bulbs can be planted out straight into their permanent positions, or can be stored in a cool place and then be planted out in late autumn. It is best to pot up smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late summer to the middle of autumn.

nwatta Requires a very well-drained sandy soil in a sunny position[42]. Bulbs can be harvested after the plants have died down in July, stored in a cool dry place and then replanted in October[1]. This species is closely related to *T. linifolia* and *T. maximowiczii*[90].

### 6.2.478 *Berberis chinensis*

5 tin 9 cyuc 1 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta *Berberis chinensis* is a deciduous Shrub. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177].

tcanta A yellow dye is obtained from the root.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of *Berberis* species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of



by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Rather slow, but you usually get a good percentage rooting[78]. June is the best time to take cuttings[202]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. Established plants are drought resistant. Tolerates shade and can be grown under other trees[K]. This species is notably resistant to honey fungus[88, 200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Fruiting as it does in April and May, this plant has excellent potential as a fruit crop, it should be fairly easy to selectively breed for improved fruit size and flavour[K]. The small flowers have a strong, pleasant scent that pervades the garden on calm days[K].

## 7.1.6 Alnus rubra

Red Alder, Oregon Alder

tfo2n 6 tlin 8 cyuc 2 kcaak 4 tcan 2 dwat 20 m hkuc hmimhtut cyutli tucphja7n hwicli hylisjnutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta Alnus rubra is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in March, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It can fix Nitrogen. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Inner bark SapEdible Uses: Catkins - raw or cooked. They are rich in protein but have a bitter flavour and are not very palatable[172]. Inner bark - cooked, it must be dried since it is emetic when fresh[105, 161, 177]. No more details are given but inner bark is often dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[K]. Sap - raw[118]. Harvested in late winter, the flow is best on a warm, sunny day that follows a cold frosty night. A sweet flavour, it was often used to sweeten other foods[257]. Buds[105, 177]. No further information is given, does this refer to the flower buds or leaf buds?[K]

tcanta Charcoal Dye Fodder Fuel Hedge Pioneer Shelterbelt Soil stabilization Tannin WoodA fast-growing and very wind resistant tree, it is an excellent plant for providing rapidly produced shelterbelts[K]. The trees extensive root system also makes it suitable for controlling erosion along the banks of rivers[226]. This is an excellent pioneer species for re-establishing woodlands on disused farmland, difficult sites etc[226]. Its fast rate of growth means that it quickly provides sheltered conditions to allow more permanent woodland trees to become established. In addition, bacteria on the roots fix atmospheric nitrogen - whilst this enables the tree to grow well in quite poor soils it also makes some of this nitrogen available to other plants growing nearby. Alder trees also have a heavy leaf canopy and when the leaves fall in the autumn they help to build up the humus content of the soil. Alder seedlings do not compete well in shady woodland conditions and so this species gradually dies out as the other trees become established[K]. Tannin is obtained from the bark and the strobils[82]. Both the roots and the young shoots have been used in making baskets[257]. A red to brown dye is obtained from the bark[61, 118, 257]. Wood - soft, brittle, not strong, light, close and straight-grained, very durable in water[82]. An important

lumber tree, it makes a good imitation mahogany[60, 103] and is used for cheap furniture etc[46, 61, 82, 171, 229]. A good fuel, it does not spark so can be used in the open[60, 118, 172], it also makes a high grade charcoal[103].

dwatta Anodyne Appetizer Astringent Cathartic Cytostatic Eczema Febrifuge Skin Stomachic TB TonicRed alder was widely employed medicinally by native North American Indians who mainly used the bark to treat a wide range of complaints[257]. The plant is little used in modern herbalism[K]. The bark is appetizer, astringent, cathartic, cytostatic, emetic, stomachic and tonic[61, 172, 257]. The bark contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226]. An infusion of the bark has been used in the treatment of many complaints such as headaches, rheumatic pains, internal injuries and diarrhoea[226, 257]. Externally, a poultice of the bark has been applied to eczema, sores and aches[257]. The sap is applied externally to cuts[257]. The catkins and young cones are astringent and have been chewed in the treatment of diarrhoea[257].

propta Seed - best sown in a cold frame as soon as it is ripe and only just covered[200]. Spring sown seed should also germinate successfully so long as it is not covered[200, K]. The seed should germinate in the spring as the weather warms up. When large enough to handle, prick the seedlings out into individual pots. If growth is sufficient, it is possible to plant them out into their permanent positions in the summer, otherwise keep them in pots outdoors and plant them out in the spring. If you have sufficient quantity of seed, it can be sown thinly in an outdoor seed bed in the spring[78]. The seedlings can either be planted out into their permanent positions in the autumn/winter, or they can be allowed to grow on in the seed bed for a further season before planting them. Cuttings of mature wood, taken as soon as the leaves fall in autumn, outdoors in sandy soil.

nwatta Agroforestry Services: Alley crop Agroforestry Services: Nitrogen Fodder: Bank Management: Coppice Management: Standard Regional CropLandscape Uses:Border, Erosion control, Woodland garden. Prefers a heavy soil and a damp situation[1, 11]. Grows well in heavy clay soils[11]. Tolerates very infertile sites[200]. A very wind resistant tree with excellent establishment in severely exposed sites, it tolerates severe maritime exposure[75, K]. The red alder is a very fast growing tree, even when planted in severe exposure[75, 229, K], but it is short-lived, dying when 60 - 80 years old[229]. Trees that are 5 years old from seed have reached 6 metres in height on a very exposed site in Cornwall, they are showing no signs of wind-shaping[K]. This is an important pioneer tree, quickly invading logged or burnt over sites, and providing ideal conditions for other trees to become established[229, K]. A very ornamental tree[1]. This species has a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Red alder has been estimated to fix as much as 300 kg of nitrogen per hectare[269]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 7.1.7 Albizia julibrissin

Mimosa, Silktree, Mimosa Tree,

tfo2n 6 tlin 9 cyuc 2 kcaak 2 tcan 2 dwat 12 m hkuc htut cyutli hgatkuyctup hwicli hylisjrasjnutnyik hpa7tli flat-prikliwsihpsom hpa7tmwatli xre7t hjonli

drutta Albizia julibrissin is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor

## 6.2.567 Centaurea iberica

Iberian Star Thistle, Iberian knapweed

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.9 m hkuc htut cyutli hgatkuyctup hwicli hylisjrasjnutnyik hpa7tli flat-prikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Centaurea iberica is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Edible cooked[145, 177]. The part used is not specified.

tcanta None known

dwatta Antioxidant and antimicrobial activity. Antibacterial and antifungal. Used in Turkish folk medicine to alleviate the pain and inflammatory symptoms in rheumatoid arthritis, high fever, headache, and for healing of wounds. In its native range, various uses in folk medicine are proving to have a scientific basis [1d].

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. This species is closely related to *C. calcitrapa*. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.568 Cynoglossum officinale

Hound's Tongue, Gypsiflower

5 tlin 9 cyuc 1 kcaak 2 tcan 2 dwat 0.8 m hkuc htut cyutli tcup hwicli hylisjrasjnut hpa7tli prikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Cynoglossum officinale is a BIENNIAL/PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - raw or cooked[46, 61, 105, 177, 183]. A disagreeable odour and taste[212]. Caution is advised, see the notes above on toxicity.

tcanta Leaves of *C. officinale* have been used as a mole repellent in gardens and for protection of stored vegetables and fruits from rodents [1d].

dwatta Analgesic Antidiarrhoeal Antihæmorrhoidal Antispasmodic Astringent Cancer Digestive Emollient NarcoticHound's tongue has a long history of use as a medicinal herb, though it is rarely used in modern herbalism[7, 268]. The leaves contain allantoin, a highly effective agent that speeds up the healing process in the body[238, K]. Caution should be applied, however, since narcotic effects result from large doses taken internally[7] and the plant is potentially carcinogenic[222] (though it has also been used in the treatment of cancer[218]). The leaves and roots are analgesic, antihæmorrhoidal, antispasmodic, astringent, digestive, emollient and slightly narcotic[4, 7, 9, 21, 46, 222]. The plant contains the alkaloids cynoglossine and consolidin, which are used medicinally to relieve pain[212]. They depress the central nervous system and are also potentially carcinogenic[222]. The plant has been used internally in the treatment of coughs and diarrhoea, though it is now mainly used externally as a poultice on piles, wounds, minor injuries, bites and ulcers[222, 238]. The root is harvested at the end of spring of the plants second year[7]. Another report says that it is best harvested in the autumn and dried for later

use[238]. The leaves and flowering shoots are harvested as the plant comes into flower and are dried for later use[238]. The plant has a wide antitumour reputation for cancers of various types[218]. A homeopathic remedy is made from the roots[7]. It is very effective in the treatment of insomnia[7].

propta Seed - sow in situ in early summer. The seed can be sown in spring or autumn, a period of cold stratification improves germination.

nwatta Prefers sandy, gravelly and basic soils[17]. Grows well in an ordinary well-drained soil[1]. Succeeds in full sun or partial shade[238]. The flowers are an absolute magnet for bees[K]. The plant smells of mice[17].

## 6.2.569 Dodæcætheon hendersonii

Sailor-Caps, Mosquito bills

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc pimchmim cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Dodæcætheon hendersonii is a PERENNIAL growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from March to July, in flower from April to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked[22, 46, 61, 105]. Roasted in ashes[161, 257]. It is a bulbil[60]. Leaves - cooked[46, 61, 105]. Roasted in ashes[161, 257].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[175, 200]. A short period of cold stratification may improve the germination of stored seed which should be sown in spring in a cold frame. The seed usually germinates in 1 - 12 months at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or September. Autumn is best[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Prefers a moist, rich, well-drained soil and some shade[1, 175]. Prefers woodland conditions or a cool moist shady border[111, 200]. Plants prefer a dry period when dormant in the summer[188].

## 6.2.570 Corydalis solida

Fumewort, Spring fumewort

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.2 m hkuc hmim cyutli tcup hwicli hrasjnut hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta Corydalis solida is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from March to July, in flower from April to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - boiled[46, 61, 105, 115]. Rich in starch[2]. Some caution is advised, there is a report that the plant is toxic.

tcanta None known

dwatta Anodyne Antibacterial Antispasmodic Hallucinogenic Nerve SedativeFumewort has been used as a painkiller in Chinese medicine for over 1,000 years[238]. The tuber is anodyne, antibacterial, antispasmodic, hallucinogenic, nerve and sedative[9, 13, 238]. It is used internally as a sedative for insomnia and as a stimulant and

painkiller, especially in painful menstruation, traumatic injury and lumbago[238]. It is also used for lowering the blood pressure[9, 13]. Research suggests that it also has an action in the thyroid and adrenal cortex[238]. The tuber should not be prescribed for pregnant women[238]. The tubers are harvested when the plant is dormant and are dried for later use[238].

propta Seed - best sown as soon as it is ripe, the seed rapidly loses viability if it is allowed to become dry[129]. Surface sow and keep moist, it usually germinates in 1 - 3 months at 15°c[164]. Germinates in spring according to another report[129]. Two months warm, then a cold stratification improves the germination of stored seed[134, 164]. Sow the seed thinly so that the seedlings can be allowed to grow undisturbed in the pot for their first year. Apply liquid feed at intervals during their growing season to ensure they are well fed. The seedlings only produce one leaf in their first year of growth[175] and are very prone to damping off[129]. Divide the seedlings into individual pots once they have become dormant and grow them on in a partially shaded area of a greenhouse for at least another year. Plant them out into their permanent positions when they are dormant. Division after flowering.

nwatta Prefers a moist, well-drained rather light soil, thriving in semi-shade. Grows well in a woodland garden or peat bed. Increases well when grown in a bulb frame, but less freely when grown in the garden[90]. A very ornamental[1] and easily grown plant[129]. There are some named varieties[90]. Plants seem to be immune to the predations of rabbits[233].

## 6.2.571 Polygala tenuifolia

Yuan Zhi

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Polygala tenuifolia is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young leaves - cooked[105, 177, 179]. Root - cooked[105, 177]. The core is removed and the root is boiled in several changes of water[179].

tcanta None known

dwatta Cardiotonic Expectorant Haemolytic Kidney Sedative TonicYuan Zhi contains triterpenoid saponins, these promote the clearing of phlegm from the bronchial tubes. The plant is used mainly as an expectorant and stimulant to treat bronchial asthma, chronic bronchitis and whooping cough[254]. The root is antibacterial, cardiotonic, cerebrotonic, expectorant, haemolytic, hypertensive, sedative and tonic[116, 147, 176, 218]. It acts mainly as a tonic for the heart and kidney energies[238]. It is taken internally in the treatment of coughs with profuse phlegm, bronchitis, insomnia, palpitations, poor memory, anxiety, depression and nervous tension[238]. Externally it is used to treat boils and carbuncles[147, 238]. The root is harvested in the autumn and dried for later use[238]. The leaves are used as a tonic for the kidneys[218].

propta Seed - sow spring or autumn in a cold frame[214]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Cuttings of young shoots in a frame in late spring[1].

nwatta Prefers a moderately fertile moisture-retentive well-drained soil, succeeding in full sun if the soil remains moist throughout the growing season, otherwise it is best in semi-shade[200, 238]. Dislikes shade according to another report. Plants are hardy to at least -15°c[238].

## 6.2.572 Sedum divergens

Pacific Stonecrop

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.2 m hkuc

htut cyutli hgatkyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum divergens is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[172, 177]. The leaves are very small and round, looking rather like a small green berry[256]. They have a crisp texture and were valued as a food by some North American Indian tribes who would eat them raw[256].

tcanta None known

dwatta Antihæmorrhoidal LaxativeThe plant has been used in the treatment of piles and has been given to children as a laxative[257].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil and requires a sunny position[200]. Established plants are drought tolerant[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 6.2.573 Monarda punctata

Horse Mint, Spotted beebalm

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.8 m hkuc

hmimhtut cyutli kyuctup hwicli hrasjlutnyikfrp hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Monarda punctata is a ANNUAL/PERENNIAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Condi- ment TeaLeaves - raw or cooked. A strong aromatic taste, they are used as a flavouring in salads and cooked foods, and also as an aromatic tea[183].

tcanta Essential IncenseThe plant has a pleasing aroma and has been hung in the house as an incense[257].

dwatta Antiseptic Carminative Diaphoretic Diuretic Emenagogue Rubefacient Stimulant Stomachic VesicantHorse mint was traditionally taken by several native North American Indian tribes to treat nausea and vomiting, and to encourage perspiration during colds. It was also applied externally as a poultice to treat swellings and rheumatic pains[254]. Nowadays it is used primarily to treat digestive and upper respiratory tract problems[254]. The leaves are carminative, diaphoretic, diuretic, emmenagogue, rubefacient, stimulant, stomachic and vesicant[4, 61, 238]. An infusion of the leaves is used in the treatment of flatulence, nausea, indigestion,

germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. It is best to take the cuttings in June[202]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel, November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Cascades, Erosion control, Hedge, Screen, Seashore. Succeeds in most soils that are well-drained[11, 200]. Dislikes very alkaline soils[202]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. Grows well in heavy clay soils. Very drought and shade resistant[200]. Tolerates maritime exposure[75]. Plants are hardy to about -15°c[200]. The foliage can be damaged in severe wind-chill conditions[202]. This is a potentially valuable fruit crop, fruiting as it does in April and May[K]. There are a number of named varieties[200, 202] and so there is plenty of scope for improving size and quality of fruit by selective breeding. Most cultivars are variegated and therefore slower-growing than the species[K]. This species is notably resistant to honey fungus[88, 200]. The small flowers have a sweet but pungent aroma. They pervade the garden for some distance on sunny days[245]. Closely related to *E. glabra*[11]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Special Features:Not North American native, Naturalizing, Fragrant flowers, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.)

## 7.1.4 Cercis siliquastrum

Judas Tree, Redbud

tfo2n 6 tlin 9 cyuc 4 kcaak 4 tcan 0 dwat 12 m hkuc

hmimhtut cyutli hgatkyuctup hwicli hyhshrasjlutnyik hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta Cercis siliquastrum is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Ni- trogen. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers SeedpodEdible Uses: Flowers - raw[2, 89, 105]. A sweetish-acid taste, they are a nice addition to the salad bowl[11, 183, K]. The flower buds are pickled and used as a condiment[183]. Seedpods - raw[2].

tcanta WoodWood - very hard, beautifully grained, takes a very fine polish. Used for veneers[89, 200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Pre-soak stored seed for 24 hours in warm water then cold stratify for 3 months[113]. Sow spring in the greenhouse[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for their first winter. Plant them out into

their permanent positions in late spring or early summer, after the last expected frosts. Plants resent root disturbance and are best planted out in their permanent positions as soon as possible[11]. Cuttings of half-ripe wood, July/August in a frame[200].

nwatta Landscape Uses:Specimen. Succeeds in most soils and pH types, but dislikes growing in wet soils, especially when these are of clay[200]. Prefers a deep sandy loam and a very sunny position[11, 182]. Thrives on chalk[11, 98] and in dry sandy soils[98]. Probably does best on a poorish soil[49]. Succeeds in light shade[200]. Dislikes drought[200]. Dormant plants are hardy to about -15°c[202]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants do not generally thrive at Kew, they prefer a hotter, continental climate in order to fully ripen their wood[11]. One report says that plants require cool greenhouse treatment in Britain[1], though several good specimens have been seen outdoors in this country[K]. The tree often does not flower freely in Britain, especially if the previous summer was cool. Plants are susceptible to coral spot fungus, especially when growing in areas with cool summers where the wood is not fully ripened[11]. Plants in this genus are notably resistant to honey fungus[200]. Resents root disturbance, plants should be planted into their permanent positions as soon as possible, preferably in May, and should be kept well watered until established[11]. Any pruning is best carried out in the winter[202]. A very ornamental plant[1], flowering well in Cornwall[59]. It flowers better when growing in a continental climate[200]. The flowers are produced on the branches of the previous or earlier years, and also on the trunk of the plant[82]. A good bee plant[108]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Blooms are very showy.

## 7.1.5 Elaeagnus x reflexa

tfo2n 6 tlin 9 cyuc 3 kcaak 4 tcan 2 dwat 4.5 m hkuc

pcimhmimhtut cyutli hgatkyuctup hwicli hyhshrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Elaeagnus x reflexa is an evergreen Shrub growing to 4.5 m (14ft 9in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from October to December, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[K]. The fruit must be fully ripe before it can be enjoyed raw, if even slightly under-ripe it will be quite astringent[K]. The fruit contains a single large seed[K]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K].

tcanta Hedge HedgeCan be grown as a hedge in exposed positions, tolerating maritime exposure[11]. It can also be planted in windy gaps under trees in shelterbelts and will in time fill in the gaps and climb into the trees[11, 29].

dwatta CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - this is a hybrid and it will not breed true from seed. If this is not a problem, then the seed is best sown as soon as it is ripe in a cold frame[78]. It should germinate freely within 4 weeks, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed

in winter, store them in a cool fairly dry but frost-free place over the winter and then plant them out in the spring. The tubers lose moisture rapidly once they have been harvested, so make sure that you store them in a damp medium such as leafmold.

dwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Prefers a light rich soil and a sunny position[1, 27]. Another report says that it prefers light dappled shade[200]. Tolerates acid soils[160]. A climbing plant, supporting itself by twining around the thin branches of shrubs[235]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is tuberous with swollen potato-like roots [1-2].

### 7.1.2 Elaeagnus macrophylla

Broad-leaved Oleaster

tfo2n 6 tlin 9 cyuc 5 kcak 3 tcan 2 dwat m hkuc pcmihmhmtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Elaeagnus macrophylla is an evergreen Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kckahta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[105, 177]. A very acceptable rich flavour when fully ripe, though it is somewhat astringent before then[K]. A potentially very valuable crop, ripening as it does in April and May[K]. We are not sure how reliable a crop it is though, some plants bear very heavy crops whilst others rarely bear fruit[K]. The fruit is up to 30mm long and contains a single large seed[K]. Seed - raw or cooked. A mild flavour, that has a hint of peanut, it can be eaten in quantity[K]. It can be eaten together with the fruit though the seed case is rather fibrous[K].

tcanta Hedge HedgePlants can be grown as a hedge in exposed positions, they are very tolerant of maritime exposure[75, 200]. Reasonably fast-growing and providing a dense cover, it gives a very good protection from the wind[K]. Plants are very tolerant of regular trimming, they can also be cut back almost to the ground and will resprout from the base[K].

dwatta CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate freely within 4 weeks, though it may take 18 months[K]. Stored seed can be very slow to germinate, often taking more than 18 months. A warm stratification for 4 weeks followed by 12 weeks cold stratification can help[98]. The seed usually (eventually) germinates quite well[78]. Prick out the seedlings into individual pot as soon as they are large enough to handle and plant out when they are at least 15cm tall. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Good percentage[78]. It is best to take the cuttings in June[202]. Cuttings of mature wood of the current year's growth, 10 - 12cm with a heel,

November in a frame. Leave for 12 months. Fair to good percentage[78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils that are well-drained[11, 200]. Prefers a soil that is only moderately fertile, succeeding in poor soils and in dry soils[11, 200]. Succeeds in sun or shade[11, 200]. Plants are very tolerant of maritime exposure[75]. This species is hardy to about -15°c[184], succeeding in the warmer counties of Britain. This is a plant with a very big potential as a commercial fruit crop. The fruit ripens outdoors in Britain in April, a season where traditionally there is no fresh fruit available. The fruit is of a reasonable size, has a very nice flavour when fully ripe and also has a fairly large edible seed[K]. Some research needs to be carried out in order to find the conditions that are necessary to ensure good crops - some plants fruit very heavily whilst others have very light or no crops[K]. This is the second of the evergreen Elaeagnus species to ripen in the spring, about a week or 10 days later than *E. cordifolia*[K]. This species is notably resistant to honey fungus[88, 200]. Plants can succumb to wind-rock in very wet seasons[75]. Plants are sometimes damaged by voles[75]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. An excellent companion plant, when grown in orchards it can increase yields from the fruit trees by up to 10%. Allied to *E. pungens* and *E. glabra*[11]. The flowers are very aromatic[184], their aroma pervading the garden on calm days[K].

### 7.1.3 Elaeagnus pungens

Elaeagnus, Thorny olive, Thorny Elaeagnus, Oleaster, Silverberry, Silverthorn, Pungent Elaeagnus
tfo2n 6 tlin 10 cyuc 5 kcak 3 tcan 2 dwat 4 m hkuc pcmihmhmtut cyutli hgatkyuctcup hwicli hyishrasjlutnyik frip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Elaeagnus pungens is an evergreen Shrub growing to 4 m (13ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from November to February, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kckahta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked[105, 177]. About the size of a large blackcurrant, though the seed is also quite large[K]. A nice sub-acid flavour when fully ripe but astringent if eaten before then[K]. Can be made into preserves, drinks etc[183]. The oval fruit is about 15mm long[200]. Seed - raw or cooked. It can be eaten with the fruit though the seed case is rather fibrous[K]. A taste vaguely reminiscent of peanuts[K]. The seed contains 42.2% protein and 23.1% fat on a zero moisture basis[218].

tcanta Hedge HedgePlants can be grown as a hedge in exposed positions, tolerating maritime exposure[75]. Succeeds when planted under trees that have become bare at the base, in time it will scramble up into the tree and fill out the bottom[75].

dwatta Antiasthmatic Antitussive Astringent CancerThe fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214]. The leaves and the stems are concocted and used in the treatment of asthma, cough, diarrhoea, haemorrhoids etc[147, 218]. The seed is used to treat watery diarrhoea[218]. The root is astringent and is applied to sores, itchy skin etc[147, 218].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It should germinate freely within 4 weeks, though it may take 18 months[K]. Stored seed can be very slow to

catarrh in the upper respiratory tract, and to induce sweating and promote urination[4, 254]. The herb is principally used externally as a rubefacient, applied as a poultice it helps to lessen the pain of arthritic joints by increasing the flow of blood in the area and thereby hastening the flushing out of toxins[4, 254]. The leaves can be harvested before the plant flowers, or they can be harvested with the flowering stems. They can be used fresh or dried[238]. The plant is a rich source of the medicinal essential oil 'thymol', which is anti-septic[4, 213, 222]. The plant has been commercially cultivated for its essential oil, though this is now produced synthetically[222]. Thymol is also an effective hookworm remedy, but must be ingested in such large quantities that it can prove fatal to the patient[213].

propta Seed - sow mid to late spring in a cold frame. Germination usually takes place within 10 - 40 days at 20°c. When large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in early summer. The seed can also be sown in situ in late summer in areas where the winters are not too severe and will produce larger plants. Cuttings of soft basal shoots in spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division in spring or autumn. Large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in ordinary garden soil so long as it is not too dry[1, 200]. Requires a moist soil and a sunny position[200]. This species prefers a light dry alkaline soil[238]. Plants are hardy to about -10°c[260] and should succeed outdoors in most parts of Britain. A polymorphic species[200]. A good bee plant[200]. Subject to mildew in dry summers[200].

### 6.2.574 Artemisia schmidtiana

Sagebrush, Silvermound, Wormwood, Mugwort

5 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Artemisia schmidtiana is a PERENNIAL growing to 0.3 m (1ft) by 0.6 m (2ft in) at a medium rate. It is in flower from August to November, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kckahta Edible Parts: StemEdible Uses: Stems - cooked[177].

tcanta None known
dwatta None known
propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring or autumn[200]. Basal cuttings in late spring. Harvest the young shoots when about10 - 15cm long, pot up in a lightly shaded position in a greenhouse or cold frame and plant them out when well rooted. Very easy.

nwatta Landscape Uses:Border, Ground cover, Specimen. Requires a well-drained sandy soil in full sun[187]. Established plants are drought tolerant[190]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Plants are hardy to about -20°c[187]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Fragrant foliage, Inconspicuous flowers or blooms.

### 6.2.575 Acaenia anserinifolia

Pirri-Pirri Bur

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 0.1 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Acaenia anserinifolia is an evergreen Perennial growing to 0.1 m (0ft 4in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kckahta Edible Parts: LeavesEdible Uses: TeaThe leaves are used as a substitute for tea[2, 144, 173, 183].

tcanta A good ground-cover plant, tolerating some treading[200]. A carpeting plant, rooting as it spreads[208]. dwatta Antiphlogistic Diuretic VulneraryThe leaves are antiphlogistic, carminative, diuretic and vulnerary[61].

propta Seed - sow March in a greenhouse. Germination, which can be very poor, usually takes place within 1 - 3 months at 10°c[133]. When the seedlings are large enough to handle, prick them out into individual pots, planting them out in the summer. Division in April or October. Very easy, the plants can be divided at any time of the year if required, though it will need to be done in a greenhouse during the winter months. Cuttings - August in a cold frame.

nwatta An easily grown plant, it succeeds in ordinary well-drained soil in sun or semi-shade[133, 200]. Requires a warm position[208]. Adaptable to poorly-drained soils in Australia[157]. A very invasive plant, spreading freely by its procumbent rooting stems[K]. It is low-growing, however, and so can be grown as a ground cover amongst taller plants[K].

### 6.2.576 Centaurea solstitialis

St. Barnaby's Thistle, Yellow star-thistle

5 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 0.6 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli fyfixre7t hjonli

drutta Centaurea solstitialis is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kckahta Edible Parts: LeavesEdible Uses: The plant is eaten as a vegetable[100]. The part used is not specified.

tcanta None known
dwatta LithontripicThe powdered seed is used as a remedy for stone[4]. The powdered root is said to be a cure for fistula and gravel[4].

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. If you have sufficient seed it can be sown in situ in the spring, and an autumn swing in situ might also be worth trying.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. A good bee and butterfly plant the flowers are rich in nectar[171]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.577 Gagea lutea

Yellow Star Of Bethlehem

5 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Gagea lutea is a BULB growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is

in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Leaves Root**Edible Uses:** Bulb - raw or cooked[4, 105, 177]. A famine food, it is only used in times of scarcity[4]. Young leaves - cooked.

tcanta None known
dwatta None known

propta Seed - sow spring in a greenhouse[200]. Sow the seed thinly so that there is no need to transplant them, and grow the seedlings on in the same pot in the greenhouse for their first year or two. Give an occasional liquid feed to ensure they do not become nutrient deficient. Pot up the small bulbs when the plants are dormant, placing 2 - 3 bulbs in each pot. Grow them on for another year or two in the greenhouse before planting them out when they are dormant. Division. We have no details of when is the best time to divide the bulbs but suggest doing it after the leaves die down in the summer.

nwatta Requires a moist soil, preferring one on the alkaline side of neutral, and succeeding in sun or shade. The dormant bulbs are fairly hardy and will withstand soil temperatures down to at least -10<sup>o</sup>c[214].

### 6.2.578 Euphrasia officinalis

Eyebright

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.2 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli fyifxre7t hjonli

drutta Euphrasia officinalis is a ANNUAL growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Leaves**Edible Uses:** Leaves - raw[7]. They are occasionally used in salads for their slightly bitter flavour[7].

tcanta None known

dwatta Antiinflammatory Astringent Digestive Homeopathy Ophthalmic Tonic**Eyebright** has a long history of herbal use in the treatment of eye problems and is still in current herbal use[4]. It is important that only the correct forms of eyebright, with glandular hairs on the calyx, are used, since other forms do not possess medicinal virtues[268]. Eyebright tightens the mucous membranes of the eye and appears to relieve the inflammation of conjunctivitis and blepharitis[254]. Its ability to counter catarrh means that it is often used for infectious and allergic conditions affecting the eyes, middle ear, sinuses and nasal passages[254]. The whole plant is anti-inflammatory, astringent, digestive, ophthalmic and slightly tonic[4, 7, 9, 14, 165, 220]. It is taken internally in the treatment of catarrh, sinusitis, hay fever, upper respiratory tract infections etc[238]. As an ophthalmic, an infusion of the plant can be taken internally or used as an eye wash. Alternatively, the diluted juice can be dropped into the eyes[232]. Some caution should be exercised, experimentally it can induce side effects including dim vision[222]. The plant's astringency makes it inappropriate for treating dry or stuffy congestion[254]. The plant can be used externally as a poultice to aid the healing of wounds[268]. Eyebright should be harvested when in flower and can be dried for later use[238]. The dried herb is a ingredient of herbal smoking mixtures, used in the treatment of chronic bronchial coughs[4]. A homeopathic remedy is made from the expressed juice of the plant[232]. It is used particularly in the treatment of eye inflammations and colds[7, 232].

propta Sow the seed outdoors in situ in early spring amongst grass in a moist but not marshy soil[1].

nwatta Succeeds in most soils, preferring chalk or limestone[200]. Eyebright is a semi-parasitic plant, growing on the roots of various species of grass[4] and also on Trifolium pratense and Plantago species[238]. The grass does not seem to suffer unduly from this parasitism since eyebright

is an annual and its cells do not penetrate very deeply into the grass[4]. There is some doubt over the validity of the name of this species, some botanists now call it Euphrasia rostkoviana. Eyebright is a variable aggregate species, some botanists divide it into a number of different species[1, 50]. Only those forms of eyebright which have glandular hairs on the calyx possess medicinal qualities[268]. It hybridizes freely with other members of this genus[200].

### 6.2.579 Lithospermum officinale

Gromwell, European stoneseed

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.8 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lithospermum officinale is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Edible Uses: TeaThe leaves are used as a tea substitute[46, 61, 183].

tcanta DyeA purple dye is obtained from the roots. It is best harvested in the spring[178].

dwatta Contraceptive Depurative Diuretic Lithontripic Oxytotic SedativeThe mature seeds are diuretic, lithontripic and oxytotic[9, 240]. They are ground into a powder and used in the treatment of bladder stones, arthritis and febrile conditions[9]. An infusion of the leaves is used as a sedative[240]. The root is depurative[240]. A syrup made from a decoction of the root and stems is used in the treatment of eruptive diseases such as smallpox, measles and itch[240]. All parts of the plant contain a substance that inhibits the secretion of the pituitary gonadotrophic hormone[240]. Extracts of the herb possess contraceptive properties[240].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Prefers a moderately fertile well-drained soil[200].

### 6.2.580 Sedum stenopetalum

Wormleaf Stonecrop

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.2 m hkuc
htut cyutli hgatyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum stenopetalum is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta** Edible Parts: Leaves**Edible Uses:** Leaves - raw or cooked. Best used when young[85].

tcanta None known

dwatta VDAan infusion of the whole plant has been used in the treatment of venereal diseases[257].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Germinates in spring[1]. Spring sown spores germinate in 1 - 3 months at 15<sup>o</sup>c[134]. Pot on small clumps of plantlets as soon as they are large enough to handle and grow them on in light shade in a cold frame or greenhouse. Keep them humid until they are well established. When they are at least 15cm tall, plant them out into their permanent positions in late spring or early summer.

nwatta Requires a partly shaded site with preferably less than 3 hours sunshine daily[200]. Plants can be grown in old brick walls[219]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.743 Geranium sibiricum

Siberian geranium

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Geranium sibiricum is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Astringent Diuretic VulneraryThe plant is used as an astringent, diuretic and vulnerary[240].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in only moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 6.2.744 Morina longifolia

Whorlflower

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Morina longifolia is an evergreen Perennial growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Moths. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Essential IncenseThe plant is used as an incense[145, 240, 272]. The roots yield 0.34% essential oil[240].

dwatta Digestive Emetic StomachicThe stem, leaves and flowers are used in Tibetan medicine, they are said to have a sweet and astringent taste with a heating potency[241]. They are digestive, emetic and stomachic, and are used in the treatment of stomach disorders such as indigestion giving rise to vomiting and nausea[241].

propta Seed - best sown as soon as it is ripe in individual pots to minimize disturbance to the tap root. Overwinter in a well ventilated cold frame[200]. Sow stored seed in early spring in a cold frame[111]. Plant out into their permanent positions in the summer when the plants are at least 15cm tall. Division in spring is possible but very difficult. Divided plants are often extremely slow to re-establish[200]. It is best carried out immediately after the plant flowers[188]. Root cuttings in individual pots in November. Plants are quick to

produce foliage but slow to form roots. They are best left in pots for 12 months before planting out[175].

nwatta Requires a fertile, humus-rich, moisture retentive but well-drained sandy or gritty soil in a sunny position[1, 111, 200]. It grows best with a little shade and shelter from high winds[1]. Prefers a slightly acid soil[175]. A very ornamental plant[1], the leaves are spicily aromatic[187]. A fairly easy plant to grow, though it tends to be short-lived[187]. It is hardy to about -17<sup>o</sup>c when growing in a perfectly drained soil[187, 200]. It grows best in the western side of Britain, sometimes succumbing to cold in the south-east of the country[233]. Requires protection from slugs[K]. The flowers open in the evening and are pollinated by moths. If pollination does not take place by morning then the top of the pistil curves over and effects self-pollination[211]. Resents root disturbance[200].

### 6.2.745 Senecio viscosus

Sticky Groundsel, Sticky ragwort

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.4 m hkuc
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Senecio viscosus is a ANNUAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta None known

dwatta Carminative EmeticThe leaves are carminative and emetic[4].

propta Seed - sow spring in situ.

nwatta See the plants native habitat for ideas on its cultivation needs. The plant has an unpleasant odour[4].

# 7 6 tlin

## 7.1 bwon

### 7.1.1 Apios priceana

Traveler's delight

tfo2n 6 tlin 9 cyuc 5 kcaak 3 tcan 0 dwat 3 m hkuc
hmmihmtt cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Apios priceana is a PERENNIAL growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: Root**Edible Uses:** Tuber - raw or cooked[62]. It has a delicious flavour somewhat like sweet potatoes when roasted. The tuber can also be dried and ground into a powder. The tuber is solitary, unlike other members of this genus that produce strings of tubers[62]. The tuber can be 15cm thick and somewhat longer[235].

tcanta Nitrogen fixer.

dwatta None known

propta Seed - pre-soak for 3 hours in tepid water and sow February/March in a cold frame. The seed usually germinates in 1 - 3 months at 15<sup>o</sup>c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for their first winter, planting them out in late spring or early summer. Division can be carried out at almost any time of the year, though spring is probably the best time. Simply dig up the roots, harvest the tubers and replant them where you want the plants to grow. It is also possible to harvest the tuber

dwatta Cardiac Stomachic Women's complaintsA tea made from the plant is used in the treatment of painful or irregular menstruation, diarrhoea, bronchitis, heart diseases, sore throats and stomach aches[222, 257]. Externally, it is used as a lotion on backaches, hand sores etc and as a gargle for sore throats[257]. Caution is advised in the use of this plant, see the note above on toxicity.

propta Seed - surface sow in situ in the spring[222].

nwatta Prefers a moist, well-drained rather light soil, thriving in semi-shade[1]. Grows well in a woodland garden or peat bed. Plants seem to be immune to the predations of rabbits[233].

## 6.2.739 *Gentiana tubiflora*

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Gentiana tubiflora* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antidote Antiinflammatory FebrifugeThe entire plant is used in Tibetan medicine, it is said to have a bitter taste and a cooling potency[241]. Antidote, anti-inflammatory and febrifuge, it is used in the treatment of headaches and redness of the eyes, inflammation of the throat and inflammation of the gall bladder giving rise to yellowish skin[241].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200].

## 6.2.740 *Semiaquilegia adoxoides*

Tian Kui

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Semiaquilegia adoxoides* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable

for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Depurative Diuretic Febrifuge Skin UrinaryThe root is specifically recommended in the treatment of dry scabby skin and urinary disorders[218]. The tubers are depurative, diuretic and febrifuge[218].

propta Seed - best sown as soon as it is ripe in a cold frame. It can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.741 *Adonis aestivalis*

Pheasant's Eye, Summer pheasant's eye

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli fyfxre7t hjonli

drutta *Adonis aestivalis* is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Cardiotonic Diuretic Laxative LithotropicThe plant is a cardiotonic, diuretic and stimulant[13, 46, 61]. Some caution is advised in the use of this remedy, see the notes above on toxicity. The flowers are considered to be diuretic, laxative and lithotropic[240].

propta Seed - best sown in situ as soon as it is ripe in the autumn[1], though it can also be sown in situ in the spring[134].

nwatta Grows well in ordinary garden soil[1]. Prefers a moist well-drained soil in sun or semi-shade[200]. A greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Very closely related to *A. annua*[200].

## 6.2.742 *Asplenium adiantum*

Black Spleenwort

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli hjonli

drutta *Asplenium adiantum-nigrum* is an evergreen Fern growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, and the seeds ripen from June to October. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta HairA decoction of the herb is a good hair wash[17].

dwatta Bitter Contraceptive Diuretic Emmenagogue Expecto- rant Laxative Ophthalmic PectoralThe plant is bitter, diuretic, laxative and ophthalmic[240]. It is taken internally to treat diseases of the spleen, jaundice and ophthalmia[240]. It is said to produce sterility in women[240]. A decoction or syrup made from the fronds is emmenagogue, expecto- rant and pectoral[240]. It is used to relieve troublesome coughs[4].

spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Bulbils harvested in late summer and planted out immediately.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are very drought tolerant[200], they grow well in dry soils and can be grown on a wall[200]. Plants are viviparous, producing bulbils in their leaf axils at flowering time[83, 200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 6.2.581 *Urospermum dalechampii*

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Urospermum dalechampii* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw. They can be used in salads but are very bitter[217].

tcanta None known

dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in situ either as soon as it is ripe in late summer or in the spring. Division.

nwatta Succeeds in any fertile soil in a very sunny position[233]. A very ornamental plant[233].

## 6.2.582 *Pinellia ternata*

Ban Xia, Crowdipper

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Pinellia ternata* is a CORM growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root[177]. The tuber is about 12mm in diameter[266]. No more details of edibility are given in these reports but caution is advised since the fresh root is toxic[238]. The toxins can be destroyed by thoroughly drying, or very well cooking the root[K].

tcanta None known

dwatta Antiemetic Antiplogistic Cancer Expecto- rant Febrifuge Sialagogue StypticThe root of ban xia is antiemetic, antiplogistic, expecto- rant, febrifuge, siala- gogue and styptic. It also strengthens the spleen[147, 174, 176, 178, 279]. Modern research has shown that this remedy is very effective in controlling nausea and vomiting[238]. It is also an ingredient of a Chinese prescription for removing gallstones without surgery, a process that usually causes severe nausea[238]. The root is also used internally in the treatment of coughs with thin watery phlegm and gastritis[238]. The fresh root is extremely acid and contains toxins, these are neutralized upon drying or by soaking in tea or vinegar[238]. The root is harvested in the summer and dried for later use, it should not be used fresh[174, 238]. Extracts of the plant have been shown to have analgesic, antiemetic, anticancer and sedative activity[218].

propta Seed - we have no information but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow

them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of offsets as new growth begins in spring[238]. Bulbils from the leaf axils can be potted up in late summer and be planted out in late spring[238].

nwatta An easily grown when given a rich soil, it requires plenty of water in the growing season[1]. Succeeds in full sun or partial shade[188]. This species is cultivated as a medicinal plant in China[178]. Plants produce bulbils in their leaf axils and when growing in suitable conditions can become invasive[188, 238]. The plants can be naturalized in woodland[1].

## 6.2.583 *Gaultheria insana*

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik  
hpa7tmwatli xre7t hjonli

drutta *Gaultheria insana* is an evergreen Shrub growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from April to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Most members of this genus have more or less edible fruits, but it is unwise to eat the fruits of this species. See below under medical uses for more information.

tcanta None known

dwatta The fruits cause intoxication when consumed[192]. The person becomes confused, often suffers delirium and, if the fruit is taken in excess, a permanent mental condition that mimics insanity can be caused[192].

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Layering.

nwatta Prefers a cool moist but not boggy humus rich soil in shade or semi-shade[11, 200]. A peat and moisture loving species, it requires a lime-free soil[11, 200]. Prefers full sun but tolerates light shade[11, 200]. This species is slightly tender in Britain and does not succeed in the colder parts of the country[11]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.584 *Hypericum erectum*

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli fyfxre7t hjonli

drutta *Hypericum erectum* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems[105, 177]. No more details.

tcanta None known  
dwatta Astringent GalactogogueThe leaves and flowering tops are galactogogue[218]. The stems are rich in tannin and are used in the treatment of arthritis, lumbago, neuralgia and rheumatism[218].

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°c. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any reasonably good well-drained but moisture retentive soil[1]. Succeeds in sun or semi-shade but flowers better in a sunny position[200]. One report says that the plant is vigorous but not quite hardy in Britain[1]. This seems to be a mistake, other reports say that it is hardy to zone 6, tolerating winter temperatures down to -15°c or lower[200].

## 6.2.585 Iris ensata

Japanese Water Iris

5 tlin 8 cyuc 1 kcak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcuphja7n hwicli hrasjlut hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta Iris ensata is a PERENNIAL growing to 0.6 m (2ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: RootEdible Uses: Root - the source of an edible starch[2, 105, 177]. Some caution is advised, see the notes above on toxicity.

tcanta Basketry Broom Fibre ThatchingA fibre is obtained from the leaves, a substitute for hemp[42]. It is used for rope and coarse cloth[74]. Also used in thatching and basket making[123]. The root is long and fibrous, it is used for making brooms, brushes etc[178].

dwatta Alternative Anthelmintic Antidote Appetizer Depurative Diuretic Hepatic VermifugeThe root is alterative, anthelmintic, antidote, appetizer, depurative, diuretic, hepatic and vermifuge[61, 178, 218]. It is used with other herbs in the treatment of venereal affections, liver complaints and dropsy[240].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division in March or October. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Massing, Specimen, Woodland garden. Prefers a light well-drained soil and a sunny position[42]. Prefers partial shade[188]. Likes plenty of moisture and a rich loamy slightly acid soil[79, 200]. Requires a lime-free soil[233]. Some cultivars, in particular the 'Higo' strain, tolerate a pH up to 7.4[200]. Plants can be grown in containers in pond margins but are then best kept in drier conditions over winter[200]. This species is hardy to about -20°c[187]. Cultivated for its root in Japan[2]. (for the starch). There are many named varieties, selected for their ornamental value[187, 200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, North American native, All or parts of this plant are poisonous, Wetlands plant, Suitable for cut flowers.

## 6.2.586 Matricaria recutita

German Camomile

5 tlin 9 cyuc 1 kcak 4 tcan 5 dwat 0.5 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikwishsom hpa7tmwatli xre7t hjonli

drutta Matricaria recutita is a ANNUAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: Condiment TeaThe young sprigs are used as a seasoning[15]. The dried flowers are used to make herb teas[21, 37]. It is aromatic but with a very bitter flavour[4].

tcanta Dye Essential Hair Liquid feed Repellent StrewingAn infusion of the flowers is used as a hair shampoo, especially for fair hair[14, 20, 168]. It is also used as a liquid feed and general plant tonic, effective against a number of plant diseases[14, 18, 20]. The flowers are also an ingredient of 'Quick Return' herbal compost activator[32]. The whole plant was formerly used as a strewing herb[4, 168]. The whole plant is insect repellent[14, 20]. An essential oil from the whole plant is used as a flavouring and in perfumery[46]. Yellow to gold dyes are obtained from the flowers[168].

dwatta Anodyne Antiinflammatory Antiseptic Antispasmodic Carminative Cholagogue Diaphoretic Homeopathy Nervine Stomachic Tonic VasodilatorGerman camomile is a well known herbal remedy and is much used in the West. In particular it is an excellent herb for treating various digestive disorders, nervous tension and irritability and is also used externally to treat skin problems[254]. An infusion of the flowers is taken internally as an anodyne, anti-inflammatory, antiseptic, antispasmodic, carminative, cholagogue, diaphoretic, emmenagogue, febrifuge, sedative, stomachic, tonic and vasodilator[7, 218, 238]. An infusion is particularly useful as a stomachic, nervine and sedative for young children, especially when they are teething[238]. It is also used in the treatment of irritable bowel syndrome, Crohn's disease, peptic ulcers and hiatus hernia[254]. In large doses, or when taken regularly for several times each day, the tea can be emetic[218] and can also cause the symptoms it is intended to cure[232]. The flowers are also used externally to treat wounds, sunburn, burns, haemorrhoids, mastitis and leg ulcers[238]. The flowers are harvested when fully open and are dried for later use[254]. The flowers contain various volatile oils including proazulenes[254]. Upon steam distillation these proazulenes produce chamazulene, this is remarkably anti-allergenic and is useful in the treatment of asthma and hay fever[254]. The flowers are sometimes added to cosmetics as an anti-allergenic agent[238]. The whole plant, harvested when in flower, is used to make a homeopathic remedy[232]. It is especially suited to teething children and those who have been in a highly emotional state over a long period of time[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Camomile for coughs and bronchitis, fevers and colds, inflammations of the skin, inflammation of the mouth and pharynx, tendency to infection - improve immunity, wounds and burns (see [302] for critics of commission E).

propta Seed - sow spring or autumn in situ[238]. Germination should take place within 3 weeks.

nwatta An easily grown plant, it succeeds in any well-drained soil in a sunny position[200]. It prefers neutral to slightly acid conditions and succeeds in poor soils[238]. It usually self-sows freely when well-sited[K]. Chamomile has a long history as a gentle and effective folk medicine for a wide variety of disorders, being especially effective and safe for children[K]. There is some confusion between this plant and Chamaemelum nobile as to which is the genuine camomile. This species is said to be more bitter and inferior to Chamaemelum nobile in some reports[200] and to be more active medicinally in other reports[9, 238]. Both have similar properties and can probably be used interchangeably[K]. The whole plant has a pungent aroma[245].

A poultice of the warmed root has been applied to treat the pain of toothache[257]. An infusion of the crushed seed has been drunk and used externally in the treatment of stomach or bowel cramps[257].

propta Seed - sow spring in an outdoor seedbed. Germination usually takes place within 3 weeks. Plant the seedlings into their permanent positions when they are large enough to handle. If seed is in short supply, it can be sown in spring in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer.

nwatta Requires a well-drained soil and a sunny position[200]. Dislikes acid soils[200]. Tolerates poor soils[200]. Grows well on a sunny wall and is indeed longer lived in such a position[166]. A polymorphic species[155], it is possibly a form of *E. asperum*[1].

## 6.2.735 Linum strictum

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 0.4 m hkuc

htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Linum strictum is a ANNUAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known  
dwatta EmollientThe seeds are used as an emollient[240].

propta Seed - sow early spring in situ.

nwatta Prefers a light well-drained moderately fertile humus-rich soil in a sunny sheltered position[200].

## 6.2.736 Galax urceolata

Beetleweed, Wandflower

5 tlin 8 cyuc 0 kcak 2 tcan 1 dwat 0.2 m hkuc  
pcimhmim cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Galax urceolata is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta None known  
tcanta An attractive ground cover, the leaves turn bronze-red in winter[200]. Plants should be spaced about 25cm apart each way[208].

dwatta Kidney VulneraryThe plant is used for healing all kinds of wounds and cuts[207]. An infusion of the root is used to treat kidney problems[257].

propta Seed - sow early spring or autumn in a shaded cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division with care in early spring[200].

nwatta Landscape Uses:Border, Container, Ground cover, Rock garden, Specimen, Woodland garden. Requires a moist humus-rich lime-free soil with part day shade[200]. Succeeds in full shade[208]. Plants can succeed in the dry shade of trees[233]. Succeeds in the woodland garden, large rock gardens or as an edging for shady paths[200]. Plants like an annual mulch of pine needles or other acid organic matter each spring[200]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of

"heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 6.2.737 Geranium robertianum

Herb Robert, Robert geranium

5 tlin 9 cyuc 0 kcak 2 tcan 2 dwat 0.4 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Geranium robertianum is a ANNUAL/BIENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insect. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta Dye RepellentFreshly picked leaves are rubbed on the body to repel mosquitoes[53]. They impart their own peculiar odour. A brown dye is obtained from the whole plant[168].

dwatta Antidiarrhoeal Antirheumatic Astringent Diuretic Homeopathy VulneraryHerb Robert is little used in modern herbalism, but is occasionally employed as an astringent to halt bleeding, treat diarrhoea etc in much the same way as *G. maculatum*[254]. The leaves are antirheumatic, astringent, mildly diuretic and vulnerary[7, 9, 21, 222, 238]. Modern research has shown that the leaves can lower blood sugar levels and so it can be useful in the treatment of diabetes[244]. An infusion of the leaves is used in the treatment of bleeding, stomach ailments, kidney infections, jaundice etc[222]. Externally, a wash or poultice is applied to swollen and painful breasts[222], rheumatic joints[7], bruises, bleeding etc[9]. It is best to use the entire plant, including the roots[9]. The plant can be harvested at any time from late spring to early autumn and is usually used fresh[9, 238]. A homeopathic remedy is made from the plant[9]. Details of uses are not given in this report[K].

propta Seed - sow spring in situ.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200], succeeding in dry soils[238]. Grows well on woodland edges[24]. The whole plant has an unpleasant aroma[244]. The foxy smell is particularly pronounced after rain[245]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 6.2.738 Corydalis aurea

Scrambled Eggs

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.5 m hkuc  
hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Corydalis aurea is a ANNUAL/BIENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known



be put in their final position whilst small since they resent root disturbance[200]. A very ornamental plant[1], there are some named varieties[233]. A good bee plant. Special Features:Not North American native, Naturalizing, Suitable for cut flowers, Suitable for dried flowers, Extended bloom season in Zones 9A and above, Attractive flowers or blooms.

## 6.2.732 Gentiana andrewsii

Closed Bottle Gentian, Dakota gentian  
5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gentiana andrewsii is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Antidote Appetizer Bitter Digestive Ophthalmic Poultice Stomachic TonicThe root is said to be an antidote to snakebites[61, 254]. An infusion of the roots has been used as a wash and also taken internally in the treatment of pain and headaches[257]. An infusion of the roots has been used as drops for sore eyes[257]. This N. American species has medicinal properties practically identical with the European gentians[4]. The following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is antelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown in early January in a light position in a cold frame[239]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric

humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species is fairly easy to grow, succeeding in most humus-rich soils[239]. It tolerates more shade (but not full shade) than most members of the genus, growing well in a woodland garden[200, 239]. Plants are intolerant of root disturbance[200]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1].

## 6.2.733 Potentilla hippiana

Woolly Cinquefoil  
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwish-som hpa7tmwatli fyfibre7t hjonli

drutta Potentilla hippiana is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Oxytoxic Poultice SalveThe whole plant is oxytoxic, poultice and salve[155]. An infusion of the plant has been used to expedite childbirth[257]. The plant has been used as a lotion on burns and a poultice of the fresh leaves applied to injury[257]. The plant is dried, powdered and applied to sores[257].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an alkaline soil but tolerates a slightly acid soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.734 Erysimum capitatum

Coastal Wallflower, Sanddune wallflower, Contra Costa wallflower, San Luis Obispo wallflower, Pursh'  
5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli kyuctcup hwicli hyishrasljutnyik hpa7tli priklwis hpa7tmwatli xre7t hjonli

drutta Erysimum capitatum is a BIENNIAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known  
dwatta Antirheumatic Odontalgic Poultice SkinA preventative against sun burn, the plant was ground up then mixed with water and applied to the skin[213]. It relieves the pain caused by overexposure to heat[155]. A poultice of the whole pounded plant has been applied to open fresh wounds and rheumatic joints[257]. An infusion of the whole plant has been used as a wash on aching muscles[257]. The crushed leaves have been sniffed as a treatment for headaches[257].

## 6.2.587 Anemone flaccida

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc  
pcimhmm cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfibre7t hjonli

drutta Anemone flaccida is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - cooked[46, 61, 177]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Succeeds in ordinary garden soil but prefers a woodland soil[1]. Prefers a moist peaty soil in some shade[187]. Plants succeed in maritime gardens[233]. Hardy to at least -20°C[187]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. A good woodland plant[1, 187].

## 6.2.588 Vaccinium tenellum

Small-Cluster Blueberry  
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium tenellum is a deciduous Shrub growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. A poor taste and texture[200]. The fruit is about 6 - 8mm in diameter[200].

tcanta None known  
dwatta None known  
propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.589 Ranunculus kochii

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ranunculus kochii is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers StemEdible Uses: Young stems[177]. No more details are given. Petals[177]. No more details are given. Caution is advised for both these uses, see the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Prefers a moist loamy soil[1]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.590 Carex hirta

Hammer sedge  
5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc  
hmimhtut cyutli tucpja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Carex hirta is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from June to July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

tcanta BeddingThe leaves are used for bedding[61].  
dwatta DiureticDiuretic[61].  
propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.591 Sedum oreganum

Oregon stonecrop  
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli hgatkyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfibre7t hjonli

drutta Sedum oreganum is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young shoots - raw or cooked[60, 177, 256].

tcanta Plants can be grown as a ground cover when planted about 25cm apart each way[208].

dwatta None known  
propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. Can be grown on a wall[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 6.2.592 Polygala vulgaris

Milkwort, Common milkwort  
5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.4 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Polygala vulgaris is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves are used as a tea substitute[177]. They are used to adulterate green China tea[2].

tcanta None known  
dwatta Diaphoretic Diuretic Expectorant StimulantThe bitter-tasting milkwort has a reputation for increasing milk flow in nursing mothers, but this belief is in fact unfounded[254]. Whilst little used in modern herbalism, the root and aerial parts of the plant contain triterpenoid saponins which promote the clearing of phlegm from the bronchial tubes and so is a valuable herb for the treatment of respiratory problems such as chronic bronchitis, bronchial asthma and convulsive coughs such as whooping cough[254]. The plant is also thought to have sweat-inducing and diuretic properties[254].

propta Seed - sow spring or autumn in a cold frame[214]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Cuttings of young shoots in a frame in late spring[1].

nwatta Prefers a moderately fertile moisture-retentive well-drained soil, succeeding in full sun if the soil remains moist throughout the growing season, otherwise it is best in semi-shade[200]. Dislikes shade according to another report. A very polymorphic species[200].

## 6.2.593 Iris germanica florentina

Orris, Orris-root  
5 tlin 10 cyuc 1 kcaak 0 tcan 3 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli fyfxxre7t hjonli

drutta Iris germanica florentina is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy)

soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe root can be dried, ground into a powder and used as a food flavouring[105]. The root may take several years of drying to develop its full fragrance[168].

tcanta Beads Cosmetic Dye Essential IncenseThe root is a source of Orris powder which has the scent of violets[238]. It is obtained by grinding up the dried root[4, 7, 46]. It is much used as a fixative in perfumery and pot-pourri, as an ingredient of toothpastes, breath fresheners etc and as a food flavouring. The root can take several years of drying to fully develop its violet-like fragrance, when fresh it has an acrid flavour and almost no smell[4, 168]. An essential oil is obtained from the fresh root, this has the same uses as the root[57, 61]. The root has been burnt in open fires in order to sweeten the smell of a room[245]. The juice of the root is sometimes used as a cosmetic and also for the removal of freckles from the skin[4]. A black dye is obtained from the root[168]. A blue dye is obtained from the flowers[168]. The seeds are used as rosary beads[61]. Plants can be grown for ground cover, the dense mat of roots excluding all weeds[208].

dwatta Diuretic Purgative StomachicThe dried root is diuretic, expectorant and stomachic[21, 238]. It is taken internally in the treatment of coughs, catarrh and diarrhoea[238]. Externally it is applied to deep wounds[238]. The root is harvested in late summer and early autumn and dried for later use[238]. The juice of the fresh root is a strong purge of great efficiency in the treatment of dropsy[4].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. A sterile plant, it does not produce seed[233]. Division, best done after flowering though it is usually successful at most times of the year. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Massing, Specimen. Prefers a sunny position in a well-drained soil that contains some lime[1, 79]. Grows well in dry soils in light deciduous shade[187]. Succeeds in full sun or partial shade[79]. Prefers a pH in the range 6 to 7.5 or higher[200]. The plant is sometimes cultivated for the essential oil in its root[9, 46]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attracts birds, Not North American native, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Suitable for cut flowers, Fragrant flowers.

## 6.2.594 Senecio vulgaris

Groundsel  
5 tlin 9 cyuc 1 kcaak 3 tcan 2 dwat 0.3 m hkuc  
htut cyutli kyuctcup hwicli hyishrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli fyfxxre7t hjonli

drutta Senecio vulgaris is a ANNUAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower all year, and the seeds ripen all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked or raw[7, 105]. The young leaves have been used in many areas as a salad, though this is very inadvisable, see the notes on toxicity at the top of the page[7].

tcanta A good food plant for the caterpillars of many butterfly and moth species, and is one of only two species that provide food for cinnabar moth caterpillars. Dynamic accumulator.

dwatta Anthelmintic Anticonvulsant Antiscorbutic Diaphoretic Diuretic Emmenagogue Homeopathy Poultice

treatment of nose bleeds and haemorrhoids and is used externally to treat Trichomonas vaginitis[176]. The fresh herb is a cardiac and nervous sedative, producing a hypnotic state with a diminution of the senses followed by a paralysing action[218]. A constituent similar to digitalis can be extracted from the whole herb with the roots removed[176]. This is cardiotonic[176].

propta Seed - best sown as soon as it is ripe in early summer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame.

nwatta Requires a well-drained humus-rich gritty soil and a sunny position[200]. Tolerant of alkaline soils[200]. This species is closely related to *P. cernua*[200]. Large plants have a deep woody rootstock and transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.729 Inula royleana

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliw hpa7tmwatli fyfxxre7t hjonli

drutta Inula royleana is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Disinfectant Insecticide ParasiticideUsed as a parasiticide[145]. The plant is insecticidal[240].

dwatta Disinfectant ParasiticideThe plant is disinfectant[240]. It is also considered to be poisonous[240]. The root has been used to adulterate the roots of *Saussurea lappa*[240]. It contains 3% of an alkaloid that produces a fall in blood pressure and stimulates tone and peristaltic movements in the intestines[240].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[111].

nwatta Succeeds in a sunny position in ordinary garden soil[1]. Requires a moist well-drained soil in sun or partial shade[187]. Grows well in heavy clay soils. This species is hardy to about -20°C[187]. Plants take some years to become fully established[233].

## 6.2.730 Aristolochia clematitis

Birthwort  
5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.7 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Aristolochia clematitis is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from May to November, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Abortifacient Antinflammatory Antispasmodic Diaphoretic Eczema Emmenagogue Febrifuge Oxytoxic StimulantBirthwort has a very long history of medicinal use,

though it has been little researched scientifically and is little used by present-day herbalists[254, 268]. It is an aromatic tonic herb that stimulates the uterus, reduces inflammation, controls bacterial infections and promotes healing[238]. The juice from the stems was used to induce childbirth[268]. The plant contains aristolochic acid which, whilst stimulating white blood cell activity and speeding the healing of wounds, is also carcinogenic and damaging to the kidneys[254]. The flowering herb, with or without the root, is abortifacient, anti-inflammatory, antispasmodic, diaphoretic, emmenagogue, febrifuge, oxytoxic and stimulant[7, 9, 21, 100, 200]. Another report says that the root is used on its own[238] whilst a third says that either the fresh flowering herb or the dried rootstock can be used[268]. The plant should not be used internally without experienced supervision, externally it is used in the treatment of slow-healing cuts, eczema, infected toe and finger nails etc[9]. Use with caution, internal consumption can cause damage to the kidneys and uterine bleeding[7, 9, 21]. It should not be used by pregnant women[238].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Pre-soak stored seed for 48 hours in hand-hot water and surface sow in a greenhouse[134]. Germination usually takes place within 1 - 3 months at 20°C[134]. Stored seed germinates better if it is given 3 months cold stratification at 5°C[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer after the last expected frosts. Division in autumn[200]. Root cuttings in winter[200].

nwatta Prefers a well-drained loamy soil, rich in organic matter, in sun or semi-shade[1, 134]. Succeeds in ordinary garden soil[134]. The plant has an invasive root system[233]. Most species in this genus have malodorous flowers, often smelling like decaying flesh[245], that are pollinated by flies[200]. The insects that pollinate this plant become trapped in the hairy throat of the flower[233]. Birthwort was formerly cultivated as a medicinal plant in most of Europe[50].

## 6.2.731 Eryngium planum

Plains eryngo, Blue Cap, Eringoe, Eryngo, Flat Sea Holly  
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.7 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyfxxre7t hjonli

drutta Eryngium planum is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta None known  
dwatta DiureticThe plant is diuretic[61]. It is used in the treatment of whooping cough[238].

propta Seed - best sown as soon as it is ripe in early autumn on the surface of a well-drained compost in a cold frame[200]. The seed can also be sown in spring. It usually germinates in 5 - 90 days at 20°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring or autumn. Take care since the plant resents root disturbance[200]. Root cuttings in autumn or winter[200].

nwatta Landscape Uses:Border, Rock garden, Seashore, Specimen. Requires a well-drained soil and a sunny position[1]. Prefers a light sandy soil but tolerates most soil types including lime and poor gravels[200]. When grown in soils that are too rich the stems will need staking before they flop[187]. Established plants are drought tolerant[190]. Plants are hardy to about -25°C[187]. Plants should

but well-drained soil enriched with leafmold[200]. Dislikes wet soils[200]. Requires shade from the midday sun[1]. Plants prefer a sheltered position in light shade, also succeeding in full sun in humus-rich soils[230]. Plants are hardy in favoured localities in Britain but they usually require greenhouse protection in this country[1]. Plants have grown well at Kew Botanical gardens, where they have formed large colonies[230]. Apply a good organic mulch in the late autumn or lift the bulbs and store them dry in a frost free place[200]. Plant out in spring and only just cover the bulb[200]. This species is cultivated in China as a medicinal plant[238]. Grows well with ferns in a woodland setting[200]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. Plant the tubers no more than 5cm deep in the soil[233]. Special Features:Not North American native.

## 6.2.726 Corydalis cava

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.2 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Corydalis cava is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf from March to June, in flower from February to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Analgesic Antianxiety Antidepressant Antisepic Antispasmodic Antitussive Cancer Cardiotonic Hallucinogenic Hypotensive SedativeThe tuber is antispasmodic, hallucinogenic and also slows the pulse[9]. It is harvested in the spring before the plant comes into flower and dried for later use[9]. The plant should only be used under the guidance of a trained herbalist, it is used in the treatment of Parkinson's disease and other neurological disorders[9]. One report says that the plant is cultivated for its medicinal uses in Sweden, but gives no more details[175]. The following reports are for *C. yanhusuo* which, according to one authority, is the correct name for this species[218]. It is treated as a separate species here[K]. The tuber is analgesic, antiseptic, antispasmodic and sedative[176]. The root has traditionally been used to lower pain and strengthen the circulation[218]. It also has sedative properties and is used in the treatment of a wide range of ailments[218]. Various extracts from the plant have shown antitussive, cardiotonic, hypotensive and anticancer activity[218].

propta Seed - best sown as soon as it is ripe, the seed rapidly loses viability if it is allowed to become dry[129]. Surface sow and keep moist, it usually germinates in 1 - 3 months at 15°C[164]. Germinates in spring according to another report[129]. Two months warm, then a cold stratification improves the germination of stored seed[134, 164]. Sow the seed thinly so that the seedlings can be allowed to grow undisturbed in the pot for their first year. Apply liquid feed at intervals during their growing season to ensure they are well fed. The seedlings only produce one leaf in their first year of growth[175] and are very prone to damping off[129]. Divide the seedlings into individual pots once they have become dormant and grow them on in a partially shaded area of a greenhouse for at least another year. Plant them out into their permanent positions when they are dormant. Division after flowering.

nwatta Prefers a moist, well-drained rather light soil, thriving in semi-shade[1]. Grows well in a woodland garden or peat bed. There is at least one named variety, selected for its ornamental value[200]. There is some possible confusion over the name of this species. 'Flora Europaea' says that it is a synonym of *C. bulbosa*[50] but the RHS 'Dictionary of Gardening' gives *C. bulbosa* as a synonym of this species[200]. In another report this species is said to be no more than a synonym for *C. yanhusuo*[218]. Closely related to *C. solida*[200],

differing mainly in its solid tubers, rather than hollow as in *C. solida*[238]. Plants seem to be immune to the predations of rabbits[233].

## 6.2.727 Dicentra cucullaria

Dutchman's Breeches

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.1 m hkuc pcmhmmim cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Dicentra cucullaria* is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Alterative Diaphoretic Diuretic Poulitice Tonic VDAalterative, tonic[46, 61]. The dried tubers were used as a tonic and were recommended in the treatment of VD[213]. A tea made from the roots is diaphoretic and diuretic[222]. A poultice made from the leaves has been used in the treatment of skin ailments and as a muscle rub to make them more limber[222]. The plant contains an alkaloid that depresses the central nervous system - it is used in the treatment of paralysis and tremors[222].

propta Seed - best sown as soon as it is ripe in a cold frame[134]. Stored seed should be sown in March[175]. Germination usually takes place within 1 - 6 months at 15°C[175]. Two weeks warm stratification at 18°C followed by six weeks at 2°C can shorten up the germination time[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring[200]. Best done when the plant is dormant in late winter[188]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Root cuttings 7 - 10cm long in sandy soil in a cold frame[200].

nwatta Landscape Uses:Alpine garden, Seashore, Woodland garden. Easily grown in a rich light soil[1], preferably neutral to slightly acid[200]. Prefers light shade and a sheltered position[175] but also succeeds in heavier shade[200]. Plants are hardy to at least -20°C[187]. The seed is difficult to harvest, it ripens and falls from the plant very quickly[134]. The plant becomes dormant in the summer[188]. After fruit set, the bulblets of *Dicentra cucullaria* remain dormant until the autumn, when stored starch is converted to sugar. At this time also, flower buds and leaf primordia are produced below ground; these then remain dormant until spring[270]. This species is closely related to *D. canadensis*[270]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, North American native.

## 6.2.728 Pulsatilla dahurica

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Pulsatilla dahurica* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Analgesic Antiinflammatory Antispasmodic Cardiotonic Dysentery Hypnotic SedativeThe root is anodyne, anti-inflammatory, antispasmodic, astringent and sedative[174, 176, 218]. The root is an effective cure for bacterial and amoebic dysentery[176, 218]. It is also used in the

PurgativeGroundsel has a long history of herbal use and, although not an official plant, it is still often used by herbalists[4]. The whole herb is anthelmintic, antiscorbutic, diaphoretic, diuretic, emmenagogue and purgative[4, 9, 21, 54]. It is often used as a poultice and is said to be useful in treating sickness of the stomach, whilst a weak infusion is used as a simple and easy purgative[4]. The plant can be harvested in May and dried for later use, or the fresh juice can be extracted and used as required[4]. Use with caution[21]. This plant should not be used by pregnant women[7], see also the notes above on toxicity. A homeopathic remedy is made from the plant[9]. It is used in the treatment of menstrual disorders and nose bleeds[9].

propta Seed - it doesn't need any encouragement from us.

nwatta A common weed of cultivated land, it does not require cultivation. Groundsel is a good food plant for the caterpillars of many butterfly and moth species, and is one of only two species that provide food for cinnabar moth caterpillars. One report states that this plant was formerly cultivated as a food crop for livestock[54]! Since the plant is a cumulative toxin this use is most questionable.

## 6.2.595 Rhodiola tibetica

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli nyanhjen hjonli

drutta *Rhodiola tibetica* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[105].

tcanta None known  
dwatta None known

propta Seed - surface sow spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on in the greenhouse for their first winter. Plant out in early summer of the following year. Division in spring or early summer. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. This species is closely related to *R. quadrifida*[1]. The flowers of this species are dark purple[1]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Dioecious, male and female plants must be grown if seed is required.

## 6.2.596 Scabiosa columbaria

Pigeon's Scabious, Dove pincushions, Pincushion Flower

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta *Scabiosa columbaria* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay)

soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves[177]. No more details are given.

tcanta None known  
dwatta None known

propta Seed - sow spring in a cold frame. The seedlings are subject to damping off[1] so water with care and make sure to give adequate ventilation. Prick out the seedlings into individual pots once they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border. Prefers a neutral or alkaline soil and a sunny position[200]. Succeeds in ordinary garden soil[1]. Grows well in a dry sunny meadow[200]. The flowers are a good nectar source for bees and lepidoptera, the plant is also a good food source for the caterpillars of many butterfly species[200]. This species name is sometimes treated as the group name for an aggregate of species[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Not North American native, Naturalizing, Attracts butterflies, Suitable for cut flowers, Extended bloom season in Zones 9A and above, Attractive flowers or blooms.

## 6.2.597 Sedum arboroseum

Garden Stonecrop

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Sedum arboroseum* is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young plant - cooked. A famine food, it is only used when all else fails[177].

tcanta None known  
dwatta Poulitice Women's complaintsThe leaves are used

in the treatment of fevers, inflammations and wounds[218]. The leaf juice is applied to burns and eruptions[218]. The flowers are used in the treatment of vaginal fluxes, nervous afflictions of children, corneal opacity and prolapse of the genitals following labour[218]. The whole plant is crushed and used as a poultice on inflammations etc[218].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil, succeeding in dry soils but preferring one that does not dry out completely[200]. Established plants are very drought tolerant[200]. Plants can be grown on walls[200]. Requires a sunny position[188]. Hardy to at least -15°C[200]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 6.2.598 Bupleurum rotundifolium

Hare's Ear

5 tin 9 cyuc 1 kcaok 0 tcan 0 dwat 0.4 m hkuc htut cyutli kyucup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Bupleurum rotundifolium is a ANNUAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[177]. Added to salads or used as a pot-herb[2]. The leaves are also used as a spice[105, 183].

tcanta None known dwatta None known propta Seed - sow spring in situ. nwatta Requires a well-drained soil and a sunny position[200].

## 6.2.599 Drosera rotundifolia

Sundew, Roundleaf sundew

5 tin 9 cyuc 1 kcaok 0 tcan 3 dwat 0.1 m hkuc htut cyutli tcuphja7n hwicli hyishrasjlut hpa7tli frusflatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Drosera rotundifolia is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Edible Uses: Curdling agentThe juice of the plant is used to curdle plant milks[177, 183]. You heat the milk and the leaves together in order to make the milk curdle[7].

tcanta FungicideSubstances in the plant are used to curb the growth of bacteria[13].

dwatta Antibacterial Antibiotic Antispasmodic Demulcent Expectorant Homeopathy Hypoglycaemic WartsThe sundew has a long history of herbal use, having been popular for its fortifying and aphrodisiac effects[238]. It relaxes the muscles of the respiratory tract, easing breathing and relieving wheezing and so is of great value in the treatment of various chest complaints[254]. The plant has become quite rare and so it should not be harvested from the wild[254]. The flowering plant is antibacterial, antibiotic, antispasmodic, antitussive, demulcent, expectorant and hypoglycaemic[4, 7, 9, 13, 21, 46, 165, 172, 222, 238]. The plant is used with advantage in the treatment of whooping cough, exerting a peculiar action on the respiratory organs[4]. It is also used in the treatment of incipient phthisis, chronic bronchitis and asthma[4]. Externally, it has been used to treat corns, warts and bunions[257].The plant is harvested in the summer and can be dried for later use[7]. Use with caution[21]. Internal use of this herb causes a harmless colouring of the urine[9]. An extract of the plant contains plumbagin, which is antibiotic against a wide range of pathogens[222, 238]. Because of their protein digesting enzymes, the leaf juice has been used in the treatment of warts and corns[4, 222]. The entire fresh plant, harvested when it is starting to flower, is used to make a homeopathic remedy[232]. It is used mainly in the treatment of coughs[232] and is specific for whooping cough[7].

propta Seed - best sown thinly as soon as it is ripe into pots of a free-draining soil with some charcoal added and with a layer of finely chopped sphagnum moss on top[175]. Surface sow and keep the compost moist. The seed usually germinates in 1 - 2 months at 20°c[175]. Grow the plants on in the pots for their first growing season, making sure that the soil does not become dry. Divide the plants in the autumn, grow them on in the greenhouse for the winter and plant them out into their permanent positions in late spring.

nwatta Prefers a sandy peaty soil, succeeding in poor soils and bogs[1, 200]. Requires a sunny position[238]. An insectivorous plant, it can survive in nitrogen poor soils because it gets the nutrients it needs from insects[1, 7, 9, 200]. The upper surfaces of leaves are covered with hairs that secrete a sweet sticky substance[7].This attracts insects, which become smeared with it and unable to escape - the plant then exudes a digestive fluid that enables it to absorb most of the insect into its system[7].

## 6.2.600 Carlina vulgaris

Carlina Thistle

5 tin 9 cyuc 1 kcaok 0 tcan 1 dwat 0.5 m hkuc htut cyutli kyucup hwicli hyishrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli fyifxre7t hjonli

drutta Carlina vulgaris is a BIENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flowering head - cooked. Used as a globe artichoke substitute[2, 105, 177, 183], though they are considerably smaller and even more fiddly[K].

tcanta Weather forecastingThe flower heads expand in dry weather and close in moist weather. The dried flowers will continue to do this for a long time and they thus form a basic hygrometer for use in weather forecasting[4].

dwatta Diaphoretic PurgativeThe roots and leaves are diaphoretic and purgative[4].

propta Seed - surface sow in a cold frame in the spring. The seed usually germinates in 4 - 8 weeks at 15°c[138]. As soon as they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer.

nwatta Succeeds in a sunny position in ordinary garden soil[1]. Prefers an alkaline soil[138]. Prefers a poor soil[4, 200]. Plants are hardy to about -15°c[200]. The presence of this species in a meadow usually indicates a poor sandy soil[4]. This species resents root disturbance, it should be planted into its final position as soon as possible[138].

## 6.2.601 Ligusticum porteri

Porter's Licorice Root

5 tin 9 cyuc 1 kcaok 0 tcan 3 dwat 0.9 m hkuc htut cyutli kyucup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Ligusticum porteri is a PERENNIAL growing to 0.9 m (3ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe leaves are used as a flavouring, a celery substitute[155].

tcanta None known

dwatta Antirheumatic Antispasmodic Diaphoretic Diuretic Expectorant Febrifuge Kidney Stomachic TB Uterine tonicThe roots, seed and essential oil (obtained from the roots and the seed) of this plant are a bitter, camphoraceous warming herb that stimulates the circulation, kidneys and uterus[238]. They are also antirheumatic, antispasmodic, diaphoretic, digestive, expectorant, febrifuge and stomachic[155, 172, 238]. They are used internally in the treatment of eruptive fevers, bronchial infections, digestive complaints, toothache, painful menstruation and retained placenta[238]. They have also been used to treat TB. and

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta IncenseThe root extract is used as an incense[145]. The plant is used for incense[272].

dwatta Poultice StomachicA decoction of the root is cordial[240]. It is given in the treatment of colic and puerperal fever[240]. The juice of the roots is used in the treatment of fevers[272]. The bruised root is applied as a poultice to eruptions[240].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is obtained. Only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200].

nwatta Succeeds in any ordinary soil in a sunny position[200].

## 6.2.723 Pachysandra procumbens

Allegheny spurge

5 tin 8 cyuc 0 kcaok 3 tcan 0 dwat 0.3 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Pachysandra procumbens is a PERENNIAL growing to 0.3 m (1ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None Known

tcanta A low to medium density groundcover for shady areas especially with acid soils. Good for woodland gardening.

dwatta None known

propta Propagate by root division in August or September. By softwood cuttings in spring, or by layering.

nwatta An evergreen subshrub making a good groundcover. Leaves are typically deciduous in USDA Zones 5 and 6 but semi-evergreen to evergreen in Zones 7 to 9. Performs well in a variety of soils from moist to dry and a range of soil pH as long as it is growing in partial to full shade. Spreads indefinitely by rhizomes to form a dense carpet of matte blue-green leaves. Prefers well-draining, organic-rich soil that is mildly acidic 5.5-6.5 pH. Drought resistant over time. Flowers are fragrant white (staminate) showing in early spring. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. Flower: Showy, Fragrant

## 6.2.724 Iris sanguinea

Blood iris

5 tin 9 cyuc 0 kcaok 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrp hpa7tli flatprikkwis hpa7tmwatli fyifxre7t hjonli

drutta Iris sanguinea is a PERENNIAL growing to 0.8 m (2ft 7in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta InsecticideAn insecticide is obtained from the plant[218]. (from the root?)

dwatta ExpectorantExpectorant[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done in August/September after flowering but can also be done in April. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, it prefers a humus-rich soil[79, 200], succeeding in a moist border or by water[42, 79]. Grows well in heavy clay soils. Plants are very cold tolerant, but they can be damaged when dormant if the soil is too moist[79]. A very ornamental plant, there are some named varieties[200]. Plant the bulbs out very shallowly[79]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 6.2.725 Bletilla striata

Hyacinth Orchid, Urn orchid, Hyacinth Bletilla, Hardy Orchid, Chinese Ground Orchid

5 tin 8 cyuc 0 kcaok 0 tcan 3 dwat 0.4 m hkuc hmim cyutli tcup hwicli jlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Bletilla striata is a BULB growing to 0.4 m (1ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: GumNone known tcanta Gum Ink SizeThe bulb is mucilaginous, it is used as a size to impart a glossiness to ink and also to make an invisible ink (seen by wetting the paper and holding it up to the light)[178].

dwatta Antibacterial Antiinflammatory Antiphlogistic Demulcent Pectoral Skin Styptic VulneraryThe hyacinth orchid is an important wound herb in China, where it has been used medicinally for over 1,500 years[238]. The root (actually a pseudobulb) is antibacterial, anti-inflammatory, antiphlogistic, demulcent, pectoral, skin, styptic and vulnerary[147, 176, 178]. It is taken internally in the treatment of haemorrhages of the stomach or lungs, uterine bleeding and nose bleeds[238]. It is particularly effective against the endotoxin produced by *Haemophilus pertusis* in whooping cough[176]. Externally, it is mixed with sesame oil and applied as a poultice to burns, cuts, abscesses and sores[238]. The pseudobulbs are harvested when the plant is dormant and are dried for use in decoctions and powders[238].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division in autumn. Make sure that you keep plenty of soil with each plant. It is also said to be possible to transplant orchids after they have flowered but whilst they are still in leaf. Division is best carried out in the spring[230]. Each division should have a leading point and two, or preferably three, pseudobulbs/joints of the rhizome[230]. More propagating material can be obtained by cutting halfway through the rhizome during the previous growing season at the point where you wish to divide[230]. This will stimulate the production of growth buds at the point of division[230].

nwatta Landscape Uses:Border, Container, Rock garden, Specimen, Woodland garden. Requires a friable, damp

## 6.2.719 Polygala amara

Bitter Milkwort

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Polygala amara is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Bitter Diaphoretic Diuretic Emollient Expecto-rant GalactagogueThe herb is bitter, diaphoretic, diuretic, emollient, mildly expectorant, galactagogue[9, 21]. An infusion is used to treat stomach upsets, bladder and kidney dis-orders etc[9]. The plant is harvested as it comes into flower and dried for later use[9].

propta Seed - sow spring or autumn in a cold frame[214]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Cuttings of young shoots in a frame in late spring[1].

nwatta Prefers a moderately fertile moisture-retentive well-drained soil, succeeding in full sun if the soil remains moist throughout the growing season, otherwise it is best in semi-shade[200]. Dislikes shade according to another report.

## 6.2.720 Paris quadrifolia

Herb Paris

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc pcmihmim cyutli tcup hwicli hrasjlut hpa7tli flatprikli-wisslip hpa7tmwatli fyifxre7t hjonli

drutta Paris quadrifolia is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pol-linated by Flies, midges. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta DyeA red dye is obtained from the berries[13]. A yellow dye is obtained from the leaves[137].

dwatta Antianxiety Antidote Antirheumatic Aphrodisiac Detergent Homeopathy Narcotic OphthalmicThe entire plant, harvested just as it is coming into flower, is anti-rheumatic and detergent[13, 61, 178]. In large doses the herb is narcotic, producing nausea, vomiting, vertigo etc[4]. It should be used with great caution, overdoses have proved fatal to children[4]. In small doses it is of benefit in the treatment of bronchitis, spasmodic coughs, rheumatism, colic etc[4]. The plant is also used in the treatment of headaches and neuralgia[61, 178]. The seeds and the berries have something of the nature of opium, they have been used as an aphrodisiac[4]. A tincture of the fresh plant is useful as an antidote to poisoning by mercurial sublimate and arsenic[4]. A cooling ointment made from the seeds and juice of the leaves is applied externally to wounds, tumours and in-flammations[4]. The juice of the berries is used to treat eye inflammations[4]. A homeopathic remedy is made from the plant[4].

propta Seed - best sown as soon as it is ripe in late summer in a cold frame. Sow stored seed in a cold frame as soon as it is received. The seed is very slow to germinate. It produces a primary root about 7 months after sowing, this pulls the seed deeper into the soil. Leaves are produced about 4 months later[137]. Sow the seed thinly so that it does not need to be thinned and grow the young plants on undisturbed in a shady part of the greenhouse for their first two years of growth. Give an occasional liquid feed in the growing season

to ensure the plants do not become nutrient deficient. At the end of the second year's growth prick out the young plants into individual pots and grow them on for another year or two in a shady part of the greenhouse before planting them out in the spring. Division.

nwatta Easily grown in a humus-rich soil in woodland conditions[200]. Prefers a light sandy loam[42, 90]. Plants are hardy to about -15°C[200]. The presence of this plant in a truly wild state in Britain is an indicator of ancient wood-land[200]. Plants are very slow to flower from seed[137]. The flowers are very long-lived[200]. The flowers emit a strong unpleasant smell rather like decaying meat[245].

## 6.2.721 Pulsatilla chinensis

Bai Tou Weng

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Pulsatilla chinensis is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from March to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suit-able for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Analgesic Antiinflammatory Antispasmodic Car-diotoxic Dysentery Hypnotic Malaria SedativeBai Tou Weng is thought to clear toxicity and to lower fever. It is most commonly taken as a decoction to counter infection within the gastro-intestinal tract[254]. The root is anodyne, anti-inflammatory, antispasmodic, astringent and sedative[174, 176, 218]. The root is an effective cure for bacterial and amoebic dysentery[176, 218]. It is also used in the treatment of malaria, nose bleeds and haemorrhoids and is used exter-nally to treat Trichomonas vaginitis[176, 254]. The root is harvested in the autumn or before the plant comes into flower in the spring, it can be dried for later use[254]. The root con-tains the lactone protoanemonin which has an irritant and antibacterial action. Protoanemonin is destroyed when the root is dried[254]. The fresh herb is a cardiac and nervous sedative, producing a hypnotic state with a diminution of the senses followed by a paralysing action[218]. A constituent similar to digitalis can be extracted from the whole herb with the roots removed[176]. This is cardiotoxic[176].

propta Seed - best sown as soon as it is ripe in early sum-mer in a cold frame. The seed usually germinates in about 2 - 3 weeks. Sow stored seed in late winter in a cold frame. Germination takes about 1 - 6 months at 15°C. When they are large enough to handle, prick the seedlings out into indi-vidual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent posi-tions in the spring. Root cuttings, 4cm long taken in early winter, potted up in a mixture of peat and sand[175]. They can also be taken in July/August, planted vertically in pots in a greenhouse or frame.

nwatta Requires a well-drained humus-rich gritty soil and a sunny position[200]. Tolerates alkaline soils[200]. Plants are hardy to about -20°C[187]. They are said to be difficult to grow in Britain, requiring a dry winter and spring followed by a warm humid summer[187]. Large plants have a deep woody rootstock and transplant badly[200]. A greedy plant, inhibiting the growth of nearby plants, espe-cially legumes[54].

## 6.2.722 Jurinea dolomiaea

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Jurinea dolomiaea is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

headaches[155, 172]. An infusion of the roots is used exteri-ally to treat body aches[257]. The root is harvested in the autumn and can be used fresh or dried[238].

propta The seed is best sown as soon as it is ripe in a cold frame in the autumn. Stored seed should be sown as early in the year as possible in a greenhouse or cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their perma-nent positions in the summer if they have grown large enough. Otherwise, keep them in a cold frame for the first winter and plant them out in early summer. Division in spring.

nwatta Succeeds in any well-drained soil in a sunny posi-tion[200]. Succeeds in dry soils[238]. Plants are hardy to at least -15°C[238].

## 6.2.602 Stachys officinalis

Wood Betony, Common hedgenettle, Betony, Woundwort

5 tlin 10 cyuc 1 kcaak 2 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikriph hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Stachys officinalis is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves and flowering tops make a good tea substitute. Refreshing and aromatic[21, 100, 183], it has all the good qualities of tea without the negative ones[4].

tcanta DyeA fine yellow dye is obtained from the leaves[4].

dwatta Anthelmintic Antiseptic Astringent Carminative Cathartic Cholagogue Digestive Diuretic Emetic Emmena-gogue Expectorant Homeopathy Nervine Sedative Sternu-atory Tonic VulneryWood betony was at one time com-monly used as a medicinal plant in the treatment of a wide range of disorders, especially as a nervine and tonic for treating maladies of the head and as an external applica-tion to wounds[4, 7, 238]. It also stimulates the digestive sys-tem and the liver, having an overall tonic effect upon the body[254]. Wood betony is much less used nowadays, and more often forms part of a mixture of herbs[4]. The whole plant is collected when in flower in the summer and can be dried for later use[4, 254]. It is anthelmintic, antiseptic, astringent, carminative, mildly cathartic, cholagogue, di-gestive, diuretic, mildly emetic, emmenagogue, expectorant, nervine, sedative, sternutatory, tonic and vulnerary[4, 9, 14, 21, 165, 218]. It is taken in the treatment of 'frayed nerves', pre-menstrual complaints, poor memory and tension[254]. It can be taken in combination with herbs such as com-frey, Symphytum officinale, and lime flowers, Tilia species, to treat sinus headaches and congestion[254]. Wood betony can be taken on its own, or with yarrow, Achillea millefolium, to staunch nosebleeds[254]. A pinch of the powdered herb will provoke violent sneezing and it has been used as part of a herbal snuff mixture in the treatment of headaches[4]. A homeopathic remedy is made from the fresh plant[9]. It is used in the treatment of asthma and excessive perspira-tion[9].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots once they are large enough to handle and plant them out in the summer. Division in spring. Very easy, the plant can be successfully divided at almost any time of the year. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Border, Ground cover, Specimen. Prefers a light moist neutral to acid soil in sun or light shade[7, 17, 238]. A characteristic plant of healthy roadside banks on heavy soils[187]. Hardy to at least -25°C[187]. At one time bugle was often cultivated for its medicinal virtues,

though it is now little used[4]. There are some named vari-eties selected for their ornamental value[188]. An excellent bee plant[24]. Special Features:Attractive foliage, Fragrant foliage, Not North American native, Invasive, Naturalizing, Suitable for cut flowers, Suitable for dried flowers. In gar-den design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements includ-ing nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 6.2.603 Lychnis fulgens

Brilliant campion

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Lychnis fulgens is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly al-kaaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant - cooked[177].

tcanta SoapAlthough no specific mention has been seen for this species, the root of several members of this genus contains saponins, a soap substitute used for wash-ing clothes, hair etc[K]. It is extracted by boiling the roots in water[20]. Do not overboil the roots because this will break down the saponins[K].

dwatta None known  
propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individ-ual pots and plant them out in the summer. The seed can also be sown in situ in spring or early autumn though this requires more seed. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their perma-nent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, succeeding in a good gar-den soil and a warm sheltered position[1].

## 6.2.604 Achillea sibirica

Siberian Yarrow

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc htut cyutli kyuctcup hwicli hyhshrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta Achillea sibirica is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardi-ness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from Au-gust to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suit-able for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly al-kaaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Young shoots and leaves - cooked[177].

tcanta None known  
dwatta Antibacterial Antiinflammatory Carminative Di-aphoretic Emmenagogue Odontalgic Stomachic TonicThe whole plant is antibacterial, anti-inflammatory, antibacterial, carminative, diaphoretic, emmenagogue, odontalgic, stom-achic and tonic[147, 172, 218]. A decoction is used in the treatment of abscesses, abdominal cramps, amenorrhoea, bleeding, falls, snakebite and stomach ulcers[147, 218]. A poultice of the chewed root can be applied to gum sores[257].

propta Seed - sow spring or early autumn in a cold frame[133]. The seed usually germinates in 1 - 3 months[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the

summer. Division in spring or autumn. Very easy, the divisions can be planted direct into their permanent positions. Basal cuttings of new shoots in spring. Very easy, collect the shoots when they are about 10cm tall, potting them up individually in pots and keeping them in a warm but lightly shaded position. They should root within 3 weeks and will be ready to plant out in the summer.

nwatta Succeeds in most soils but prefers a well-drained soil in a sunny position[1, 200]. Plants succeed in maritime gardens[233]. They live longer when growing in a poor soil[200]. A very ornamental plant[200]. Polymorphic. Hybridizes freely with other members of this genus[200].

### 6.2.605 Sedum lanceolatum

Spearleaf Stonecrop, Subalpine stonecrop
5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.2 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum lanceolatum is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[60].

tcanta None known
dwatta Birthing aid LaxativeThe plant is laxative[257]. An infusion of the stems, leaves and flowers has been taken to clean out the womb after childbirth[257].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[190, 200]. Succeeds when grown on a wall[200]. Hardy to at least -15°C[200]. A very polymorphic species[60], it is closely related to *S. stenopetalum*, but this species is not creeping[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

### 6.2.606 Athamantha cretensis

Candy Carrot
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Athamantha cretensis is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe seed is used as a flavouring[177, 183]. An agreeable liquor is made from it[2].

tcanta None known
dwatta None known
propta Seed - sow spring in a cold frame[1]. Germination usually takes place within 3 - 6 weeks at 13°C[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed can also be sown in situ as soon as the soil is workable in the spring[134]. Division in spring, with care[200].

nwatta Succeeds in most soils[1]. Prefers a well-drained soil in full sun[200]. The long tap root is susceptible to rot in wet winters[200].

#### 6.2.607 Iris tectorum

Roof Iris, Wall iris, Japanese Roof, White Roof Iris
5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Iris tectorum is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: RootEdible Uses: Root - an edible starch is said to be extracted from it[2, 105, 177]. Some caution is advised since there are reports that the plant might be poisonous. Perhaps the extracted starch is edible.

tcanta None known
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be sown as early in the year as possible in a cold frame. Stored seed does not require cold conditions in order to stimulate germination. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first year. Plant out into their permanent positions in late spring or early summer. Division, best done in July/August after flowering. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Massing, Seashore. Prefers a well-drained loam rich in leafmold with plenty of moisture in summer and an open sunny position[1, 42, 79, 200]. Requires a really well-drained soil that is dry rather than damp, and a hot sunny position[233]. Prefers a lime-free soil but succeeds in most good soils and in partial shade[79]. Succeeds in dry soils and, once established, is drought tolerant[190]. Cultivated for its edible root in Japan[2]. There are some named varieties, selected for their ornamental value[233]. In China the plants are grown on the roofs of houses[190]. Plants do not flower so freely in cultivation in Britain. In their native habitat they experience cold dry winters and warm wet summers[187]. It is best to lift the plants in October, store them in sand in a cool frost free place over winter and replant in March[1]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: All or parts of this plant are poisonous, Attractive flowers or blooms.

### 6.2.608 Corydalis ambigua

5 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.2 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Corydalis ambigua is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from March to June, and the seeds ripen from May to June. The species is hermaphrodite (has both male and

kcaakta None known
tcanta None known
dwatta Anthelmintic Laxative StimulantThe leaves are antirheumatic, laxative and stimulant[7]. The plant is a mild laxative, but it also has a beneficial effect on the stomach and is therefore preferable to many other laxatives[7].

propta Seed - best sown in a cold frame as soon as it is ripe[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Cuttings of semi-ripe wood, June/July in a cold frame[200].

nwatta Requires a gritty well-drained circumneutral or slightly alkaline soil in full sun[200]. Grows well in a dry sunny position in the rock garden[200].

### 6.2.716 Filipendula vestita

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli priklwis hpa7tmwatli fyifxre7t hjonli

drutta Filipendula vestita is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None known
tcanta MiscellanyNone known

dwatta MiscellanyOne report says that the plant has medicinal properties but gives no details[145].

propta Seed - best sown in the autumn in a cold frame[1]. The seed can also be sown in a cold frame in spring, germinating best at a temperature of 10 - 13°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have grown enough. If not, keep them in a cold frame for the winter and plant them out in late spring. Division in autumn or winter[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a humus-rich moist soil in semi-shade[200]. Succeeds in full sun only if the soil is reliably moist throughout the growing season[200]. Dislikes dry or acid soils. Does well in marshy soils. Grows well in heavy clay soils. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.717 Senecio sylvaticus

Mountain Groundsel, Woodland ragwort
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli fyifxre7t hjonli

drutta Senecio sylvaticus is a ANNUAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaakta None known
tcanta None known

dwatta Antiscorbatic DetergentThe plant is detergent and antiscorbatic[4].

propta Seed - sow spring in situ.

nwatta See the plants native habitat for ideas on its cultivation needs. The plant has an unpleasant odour[4].

### 6.2.718 Arnica montana

Arnica, Mountain arnica
5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli frusflat-priklwis hpa7tmwatli fyifxre7t hjonli

drutta Arnica montana is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known

tcanta None known

dwatta Antiechymotic Antiphlogistic Antirheumatic Epilepsy Nervine Sternutatory VulneraryArnica has a long history of herbal use, especially as an external treatment for bruises and sprains[232, 238] - it is an ingredient of a number of proprietary preparations[238]. Internally, it has been used in the treatment of heart complaints and as a booster for the immune system[238]. Arnica increases local blood supply and accelerates healing, it is anti-inflammatory and increases the rate of absorption of internal bleeding[254]. Generally the plant is nowadays only recommended for internal use as a homeopathic medicine, principally for treating shock, injury and pain[254]. If used as a decoction or tincture it stimulates the circulation and is valuable in the treatment of angina and a weak or failing heart, but it can be toxic even at quite low doses and so is rarely used this way[254]. The flowers are the part most commonly used[4, 232], they are harvested when fully open and dried - the receptacles are sometimes removed since these are liable to be attacked by insects[4]. The root is also used, it is harvested after the leaves have died down in the autumn and dried for later use[4]. The whole plant is antiechymotic, antiphlogistic, nervine, sternutatory, vulnerary[4, 7, 9, 46, 165]. Although a very valuable remedy, it should be used with caution. It has been known to cause contact dermatitis when used externally and collapse when taken internally[238]. Only take it internally under the supervision of a qualified practitioner: The freshly crushed flowers cause sneezing if inhaled[232]. The leaves have also been smoked as a tobacco[232], though it is unclear whether this was for medicinal reasons The whole plant, harvested when in flower, is used in homeopathic remedies[232]. It is especially useful in the treatment of traumatic injuries, sores and bruises[232]. The homeopathic dose has also been used effectively in the treatment of epilepsy and seasickness, and it might be of use as a hair growth stimulant[268]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Arnica montana for fever and colds, inflammation of the skin, cough/bronchitis, inflammation of the mouth and pharynx, rheumatism, common cold, blunt injuries, tendency to infection (see [302] for critics of commission E). The essential oil has to be diluted before being used externally [301].

propta Seed - best sown as soon as it is ripe in pots outdoors. Sow stored seed in early spring in a cold frame[4]. A period of cold stratification is helpful[238]. The fresh seed can germinate in 3 - 4 weeks at 13°C according to one report[134], though it can be slow, difficult and erratic and take 2 years to germinate[268]. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the following spring. Division in spring.

nwatta Prefers a moist, well-drained humus rich soil, preferably lime-free[200]. One report says that it is often found in calcareous soils in the wild[7]. Tolerates a pH in the range 5.8 to 7.6. Prefers a mixture of sand, loam and peat[1]. Prefers a position in full sun[1, 134]. Succeeds in light woodland[14] and in a rock garden or border[1, 14]. Plants are hardy to about -25°C[187]. This species is declining in the wild, probably because of over-collection as a medicinal herb. It may become extinct in part of its range[200].



the powder retain their insecticidal properties almost indefinitely[238]. The growing plant can be used as an insect repellent in the garden[14, 18, 20]. Effective against mosquitoes and ants[201].

dwatta VermifugeDalmatian pellitory is not used medicinally, though research has shown that the flowers possess weak antibiotic activity[268]. The flowers are the main source of the insecticide pyrethrum, which is toxic to insects but not to mammals. It has sometimes been used as a vermifuge in China[147].

propta Seed - sow spring in a greenhouse. Only just cover the seed and do not allow the pot to dry out. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Industrial Crop: Pesticide Management: Hay Minor Global CropSucceeds in an ordinary garden soil[1]. Prefers a rich soil with plenty of humus[147]. Prefers a pebbly, calcareous dry soil in a sunny position[4]. When grown in moist climates the plants often die after flowering[4].Tolerates a pH in the range 5.2 to 7.5. Pyrethrum is widely cultivated as a source of an insecticide[57, 61], the growing plant is also said to repel insects from plants growing nearby[14, 18, 20].

### 6.2.712 Pinellia pedatisecta

Hu Zhang

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.2 m hkuc hmimhmtt cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Pinellia pedatisecta is a CORM growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antiemetic Antiphlogistic Cancer Expectorant Febrifuge Sialagogue Styptic UrinaryThe poisonous tubers are used as a medicine for the treatment of enlargement of the lymph node and urinary tract infections[266]. The following notes for *P. ternata* almost certainly also apply to this species[218]. The root is antiemetic, antiphlogistic, expectorant, febrifuge, sialagogue, styptic. Strengthens the spleen[147, 174, 176, 178]. Modern research has shown that this remedy is very effective in controlling nausea and vomiting[238]. It is also an ingredient of a Chinese prescription for removing gallstones without surgery, a process that usually causes severe nausea[238]. The root is also used internally in the treatment of coughs with thin watery phlegm and gastritis[238]. The fresh root is extremely acrid and contains toxins, these are neutralized upon drying or by soaking in tea or vinegar[238]. The root is harvested in the summer and dried for later use, it should not be used fresh[174, 238]. Extracts of the plant have been shown to have analgesic, antiemetic, anticancer and sedative activity[218].

propta Seed - we have no information but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division as new growth begins in spring. Bulbils from the leaf axils.

nwatta Easily grown in a rich soil, it requires plenty of water in the growing season[1]. Succeeds in full sun or partial shade[188]. Plants can be naturalized in woodland[1]. Plants produce bulbils in their leaf axils[188].

### 6.2.713 Primula reticulata

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.4 m hkuc hmimhmtt cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Primula reticulata is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta AnodyneThe herb is used externally as an anodyne[240].

propta Seed - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. Germination is inhibited by temperatures above 20°c[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in autumn. This is best done every other year[200].

nwatta Prefers a deep moist humus-rich soil, succeeding in full sun if the soil is reliably moist throughout the growing season, otherwise it requires some shade[1, 200]. Grows well in heavy clay soils. Succeeds along the sides of streams and in woodland gardens[200]. Plants self-sow when in suitable conditions[200].

### 6.2.714 Ajuga chamaepitys

Ground Pine, Yellow bugle

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.2 m hkuc hmimhmtt cyutli kyuctcup hwicli hyhishrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Ajuga chamaepitys is a ANNUAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antirheumatic Diuretic Emmenagogue Stimulant Urinary Women's complaintsThe leaves are diuretic, stimulant and emmenagogue[4]. The plant acts mainly on the urinary system and uterus[238]. It once had a high reputation in the treatment of rheumatism, dropsy, jaundice etc and has also proved of worth when used in conjunction with other herbs in the treatment of women's complaints[4]. The leaves are harvested in the summer and can be dried for later use[238].

propta Seed - sow spring in situ. Germination can be erratic[238].

nwatta Thrives in a poor dry soil in full sun[238]. Prefers a humus-rich moisture-retentive soil[200]. Plants are usually annual, but are sometimes short-lived perennials[200]. The whole plant smells of pine trees when crushed[17, 238].

### 6.2.715 Globularia vulgaris

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli priklkwis hpa7tmwatli xre7t hjonli

drutta Globularia vulgaris is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[46, 61, 105, 177].

tcanta None known

dwatta Alterative Analgesic Antiperiodic Antispasmodic Astringent Contraceptive Deobstruent Diuretic Emmenagogue Sedative TonicAlterative, antiperiodic, astringent, deobstruent, diuretic, emmenagogue, sedative, tonic[178]. The root is analgesic, antispasmodic and sedative[218]. The tuber has a history of over a thousand years use in mitigating pain[218]. This species was ranked 10th in a test of 250 potential antifertility drugs[218].

propta Seed - best sown as soon as it is ripe, the seed rapidly loses viability if it is allowed to become dry[129]. Surface sow and keep moist, it usually germinates in 1 - 3 months at 15°c[164]. Germinates in spring according to another report[129]. Two months warm, then a cold stratification improves the germination of stored seed[134, 164]. Sow the seed thinly so that the seedlings can be allowed to grow undisturbed in the pot for their first year. Apply liquid feed at intervals during their growing season to ensure they are well fed. The seedlings only produce one leaf in their first year of growth[175] and are very prone to damping off[129]. Divide the seedlings into individual pots once they have become dormant and grow them on in a partially shaded area of a greenhouse for at least another year. Plant them out into their permanent positions when they are dormant. Division in spring after flowering. Once the plants are dying down, dig up the clump and divide the tubers, planting them out straight into their permanent positions if required.

nwatta Prefers a moist, well-drained rather light soil, thriving in semi-shade[1]. Grows well in a woodland garden or peat bed[129]. This species is very closely related to and probably part of *C. fumarifolia*[175]. It is probably not really worthy of specific status and is best treated as a cultivar, *C. 'Ambigua* [200]. Plants seem to be immune to the predations of rabbits[233].

### 6.2.609 Anemone nikoensis

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmhmimhmtt cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikkwisslip hpa7tmwatli xre7t hjonli

drutta Anemone nikoensis is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[177]. Some caution is advised, see the notes above on toxicity.

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Succeeds in ordinary garden soil but prefers a moist well-drained humus-rich soil[1, 200]. Tolerates dry summer conditions[200]. This species is closely related to *A. nemerosa*[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 6.2.610 Mitchella undulata

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Mitchella undulata is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit. Not very well-flavoured[200].

tcanta Can be used as a ground cover plant in a shady position[188]. Especially good on a peat terrace or in a woodland[200]. Plants form a spreading carpet, rooting along the stems, and are best spaced about 30cm apart each way[208].

dwatta None known

propta Seed - it germinates better if given 3 months cold stratification and so it is best sown as soon as it is ripe in the autumn[113]. Sow stored seed as early in the year as possible. Make sure that all the fruit pulp is removed from the seed because it contains germination inhibitors[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of naturally layered stems in the spring[200]. Cuttings.

nwatta Requires a moist but well-drained lime-free soil and some shade[11]. Prefers a peaty soil[1, 200], succeeding in neutral to acid soils[200].

### 6.2.611 Limonium tetragonum

5 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Limonium tetragonum is a BIENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardness. It is hardy to UK zone 6. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Requires a well drained soil and a sunny position[200].

### 6.2.612 Patrinia scabiosifolia

Eastern Valerian, Scabious Patrinia

5 tlin 8 cyuc 1 kcaak 0 tcan 3 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Patrinia scabiosifolia is a PERENNIAL growing to 0.6 m (2ft) at a fast rate. It is in flower in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves, stem tips and flower buds - cooked and used as a potherb, added to soups or dried for later use[105, 177, 183].

tcanta ParasiticideNone known

dwatta Antibacterial Anticoagulant Antidote Antiphlogistic Antispasmodic Depurative Diuretic Febrifuge Haemostatic Hepatic Parasiticide ResolventThe root is antibacterial, anticoagulant, antiphlogistic, antispasmodic, depurative, diuretic, febrifuge haemostatic and resolvent[147, 174,

178, 218, 279]. It contains several medically active compounds, including triterpenic glycosides and has been shown to stimulate the liver into producing drug-metabolizing enzymes[279]. The root is used in Korea in the treatment of the initial stages of appendicitis, perityphlitis and neuralgia[279]. It is also used in the treatment of parasitic skin diseases and as an antidote to poison[218]. The entire plant is antibacterial, anti-inflammatory and hepatic[176]. It is used traditionally as a sedative[218] and also in the treatment of carbuncles, acute appendicitis, intestinal abscess, postpartum pain, dysmenorrhoea and endometriosis[176]. It stimulates the circulation, treats abscesses, promotes regeneration of liver cells[147, 174, 176, 178]. Large doses can cause a decrease of white blood cells, nausea and dizziness[176]. The crushed leaves are applied to abscesses and boils[147, 218].

propta Seed - sow in situ in April[111]. If you only have a small quantity of seed it is probably better to sow it in a pot in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. Division in spring or autumn.

nwatta Landscape Uses:Border, Massing, Rock garden. Easily grown in any light rich soil in a sunny position[1, 111]. Special Features:Not North American native, Suitable for cut flowers.

### 6.2.613 Centaurea jacea

Brown Knapweed

5 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli hgatkuyctcup hwicli hyishrasjlutnyik hpa7tli flat-prikwisslip hpa7tmwatli fyfkr7t hjonli

drutta Centaurea jacea is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta The young leaves are cooked as a vegetable [1b]. tcanta None known

dwatta Bitter Diuretic Ophthalmic Stomachic TonicThe root is bitter tonic, diuretic and stomachic[7]. An excellent bitter for treating difficult digestive systems, it is still used in rural areas as a digestive and also to reduce the temperature of feverish children[7]. A distilled water made from the leaves is used as an eye lotion in the treatment of conjunctivitis[7].

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Division in autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. This should be done at least once every three years in order to maintain the vigour of the plant. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. Plants are suitable for the wild garden and for naturalising[200]. This species is hardy to at least -15°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.614 Sisymbrium officinale

Hedge Mustard

5 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyfkr7t hjonli

drutta Sisymbrium officinale is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: CondimentYoung shoots - raw or cooked[2, 9, 85]. A bitter cabbage-like flavour, they are used as a flavouring in salads or cooked as a potherb[183, K]. Seed - raw or cooked[257]. It can be ground into a powder and used as a gruel or as a mustard-like flavouring in soups etc[85, 183].

tcanta Soil conditionerAlkaline secretions from the growing roots help to sweeten an acid soil[18].

dwatta Antiaphonic Diuretic Expectorant Laxative StomachicThe whole plant is said to be antiaphonic, diuretic, expectorant, laxative and stomachic[4, 7, 21, 46]. This plant was at one time known as the 'singer's plant' because of its use in treating loss of the voice[7]. A strong infusion of the whole plant has been used in the treatment of throat complaints[4, 238]. Excessive doses can affect the heart[238]. The dried plant is almost inactive, so it should only be used when freshly harvested[7].

propta Seed - sow spring or autumn in situ[238]. nwatta An easily grown plant, it succeeds in most soils but prefers a moist to dry acid to alkaline soil in full sun or light shade[238]. Plants are hardy to at least -15°C[238]. Hedge mustard grows well near oats but it inhibits the growth of turnips[18]. The plant has a peculiar aptitude for collecting and retaining dust[4]. This means that when growing near roads or other polluted places the leaves are seldom edible[K]. A food plant for the caterpillars of several butterfly and moth species[30].

### 6.2.615 Abies procera

Noble Fir

5 tlin 6 cyuc 0 kcaak 0 tcan 1 dwat 60 m hkuc pcmhmimhtut cyutli tcup hwicli hyishrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli hjonli

drutta Abies procera is an evergreen Tree growing to 60 m (196ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta None known tcanta WoodWood - light, hard, strong, close grained, works easily. Used for lumber, interior work, pulp etc[46, 61, 82, 229].

dwatta PectoralA decoction of the leaves has been used as a cough medicine[257].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Landscape Uses:Screen. Prefers a good moist but not water-logged soil[1]. Succeeds in cold exposed positions and in poor mountain peats[11]. Succeeds in poor thin soils so long as sufficient moisture is present[229].

### 6.2.708 Glandularia canadensis

Rose Verbena

5 tlin 9 cyuc 0 kcaak 3 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Glandularia canadensis is a PERENNIAL growing to 0.3 m (1ft) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acidic soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known tcanta A medium density groundcover. Nectary: provides nectar or pollen for beneficial insects [1-2]. Garden Uses include rock gardens or border fronts. Spreads to form an attractive ground cover with a long and floriferous summer bloom. Edging. Containers. Hanging baskets [368-1]. Both the flowers and foliage are fragrant. Landscape restoration.

dwatta None known propta Root Division , Seeds , Softwood Cuttings. Seed sown in spring or fall, cuttings, and root division are methods of propagation.

nwatta An herbaceous creeping annual or perennial plant. Prefers full to partial sun and mesic (requiring a moderate amount of moisture) to dry conditions. The soil can contain rocky material, gravel, sand, loam, or clay-loam. Avoid wet, poorly drained soils. Bloom Time: May to August. Bloom Description: Rose-pink to rose-purple. Flower: Showy. Purple flowers in the spring, which can persist until fall. Tolerate: Drought, Dry Soil, Shallow-Rocky Soil. May be grown as an annual throughout the normal range for the species, and in particular in the northern parts of USDA Zone 5 where it is not reliably winter hardy and appreciates some winter protection [1-6]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

### 6.2.709 Dryopteris oreades

Mountain Male Fern

5 tlin 9 cyuc 0 kcaak 0 tcan 4 dwat 0.6 m hkuc hmim cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Dryopteris oreades is a FERN growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. The seeds ripen from July to September. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcaakta None known tcanta None known

dwatta AnthelminticThe root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent[4, 172, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity. The root is also used in the treatment of dandruff[4, 172].

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Pot up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant

out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant[233], it prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Prefers a moist soil[188], but is drought tolerant when well established[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.710 Lysimachia nemorum

Yellow Pimpernel

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flat-prikwisslip hpa7tmwatli fyfkr7t hjonli

drutta Lysimachia nemorum is an evergreen Perennial growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None known tcanta None known dwatta Astringent An astringent herb, yellow pimpernel is used as a wound herb to staunch bleeding[254].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Basal cuttings, March to April in a cold frame. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, succeeding in a moist or wet loamy soil in sun or partial shade[200]. Hardy to at least -25°C[187]. Most species in this genus seem to be immune to the predations of rabbits[233].

### 6.2.711 Tanacetum cinerariifolium

Dalmation Pellitory, Pyrethrum

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyfkr7t hjonli

drutta Tanacetum cinerariifolium is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcaakta None known tcanta Insecticide RepellentThe dried flower buds are the source of the insecticide 'Pyrethrum'[1, 4, 14, 18, 46, 57, 61]. The pyrethrins are produced in the yellow disc florets[169]. The highest pyrethrin content is from the flowers when they are in full bloom (1.22%) and lowest in the preceding period (0.71%)[240]. This insecticide also kills many beneficial insects, though it is relatively harmless to mammals[4]. Another report says that it is non-toxic to mammals[238]. It is best used in the evening so that it will have lost much of its virulence by the morning[201]. Steep two handfuls of the dried powdered flowers in one litre of hot water for an hour. This mixture can be either pureed or strained and then used as a spray[201]. Once dried, the flowers or

hmimhtut cyutli kyucutcup hwicli hrasjlutnyik hpa7tli flat-prikliwsslip hpa7tmwatli xre7t hjonli

drutta *Aristolochia macrophylla* is a CLIMBER growing to 7 m (23ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antiseptic AntitumorThe plant contains the antiseptic and antitumor compound aristolochic acid[222]. A decoction of the root has been used externally to treat 'swelling of feet and legs'[257]. A compound infusion of stalk chips has been used in the treatment of 'yellowish urine'[257].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn. Pre-soak stored seed for 48 hours in hand-hot water and surface sow in a greenhouse[134]. Germination usually takes place within 1 - 3 months at 20°C[134]. Stored seed germinates better if it is given 3 months cold stratification at 5°C[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer after the last expected frosts. Division in autumn[200]. Root cuttings in winter[200].

nwatta Landscape Uses:Arbor, Screen. Prefers a well-drained loamy soil, rich in organic matter, in sun or semi-shade[1, 200], but succeeds in ordinary garden soil[134]. Plants are hardy to at least -10°C[200]. A fast-growing climbing plant, attaching itself by means of twining around other plants, it has been recommended for covering pergolas[200]. Most species in this genus have malodorous flowers that are pollinated by flies[200]. Special Features:Attracts birds, Attractive foliage, North American native, All or parts of this plant are poisonous, Attracts butterflies, Attractive flowers or blooms.

## 6.2.705 *Cyrtomium fortunei*

Asian netvein hollyfern

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.5 m hkuc

pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Cyrtomium fortunei* is an evergreen Fern growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Analgesic Anthelmintic Antibacterial Anticoagulant Antiviral Depurative Febrifuge HaemostaticThe rhizome is analgesic, anthelmintic, antibacterial, anticoagulant, antiviral, depurative, febrifuge and haemostatic[147, 176, 218]. A decoction is used in the treatment of hookworm, tapeworm, ascariasis, filariasis, acute infectious hepatitis and various bleeding ailments[147]. The decoction is also used as a preventative for influenza and measles[147].

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Germinates in 1 - 3 months at 20°C[164]. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division in spring or summer[188].

nwatta Requires a moderately loose soil, do not firm the soil any more than is necessary[1]. Tolerates a little direct sun but it grows better in the shade[200]. Grows well in a woodland garden[166]. Prefers a pH between 6 and 7 but this is not critical[200]. Dislikes too much winter moisture[1]. A very ornamental and hardy plant[1], tolerating temperatures down to about -30°C[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.706 *Carex morrowii*

Iwashiba, Japanese Sedge

5 tlin 9 cyuc 0 kcak 4 tcan 0 dwat m hkuc

pcimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli hjonli

drutta *Carex morrowii* is an evergreen Perennial growing to 0.6 m (2ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None Known

tcanta Carbon Farming Solutions - Industrial Crop: biomass (Crops grown for non-food uses. Industrial crops provide resources in three main categories: materials, chemicals, and energy. Traditional materials include lumber and thatch, paper and cardboard, and textiles) [1-1]. *Carex* species are popular in horticulture especially for shady positions. No information was found for *Carex morrowii* but some *Carex* native species are used in wildland habitat restoration projects, natural landscaping, and in sustainable landscaping as drought-tolerant grass replacements for lawns and garden meadows. Grows well in the shade of trees. *Carex morrowii* is typically grown for its attractive shape and foliage. Effective accent for smaller gardens. Can be grown in pots.

dwatta None Known

propta Propagation is by seed or division in spring.

nwatta Industrial Crop: Biomass Management: Hay Regional CropClimate: boreal to warm temperate. Humidity: aquatic. Best grown in moist, fertile, medium to wet soils in part shade to full shade. Soils should not be allowed to dry out. In full sun and hot sites foliage tends to bleach to an unattractive yellow. Tolerates: Deer, Heavy Shade, Erosion, Wet Soil. Carbon Farming Solutions - Cultivation: regional crop. Management: hay (Describes the non-destructive management systems that are used in cultivation) [1-1]. .

## 6.2.707 *Carex hachijoensis*

Japanese sedge

5 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.3 m hkuc

pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Carex hachijoensis* is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind, Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta ContainersA good evergreen ground cover supplying winter interest. Can be used on slope or Banks. Good in containers. Variegated forms available for foliage interest including *Carex hachijoensis* Evergold. Can make a good edging plant. Deer resistant and shade tolerant.

dwatta None Known

propta Propagate by plant division in spring or seeding in the fall.

nwatta Best grown in moist, fertile, medium to wet soils in part shade to full shade. Soils should not be allowed to dry out. In full sun and hot sites foliage tends to bleach to an unattractive yellow. Tolerates: Deer, Heavy Shade, Erosion, Wet Soil. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a 'clumping' habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

Grows well in heavy clay soils. Plants are very shade tolerant, especially when young, but they grow more slowly in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions with a pH down to about 5[200]. Grows well on a north-facing slope[200]. A long-lived tree in the wild, with specimens more than 600 years old recorded[229]. It is a very ornamental tree[1], but is very susceptible to damage by aphids in some areas of the country[1, 11]. Planted for timber in W. and N. Europe[50], in Britain it grows best in wetter parts of the country such as the Perthshire valleys of Scotland[11]. Trees do not grow well in the drier areas of Britain[81]. In a suitable site it can make new growth of 1 metre a year until it is 25 metres tall when growth slows[185]. Exposure seems to severely limit growth in height in southern and eastern regions but less so in areas of high rainfall such as N. Wales and Argyll[185]. New growth takes place from early June to August[185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Trees are sometimes used as 'Christmas trees'[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Special Features:Attractive foliage, North American native, There are no flowers or blooms.

## 6.2.616 *Pseudolarix amabilis*

Golden Larch, Chinese golden-larch

5 tlin 7 cyuc 0 kcak 0 tcan 2 dwat 40 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli hjonli

drutta *Pseudolarix amabilis* is a deciduous Tree growing to 40 m (131ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Miscellany WoodThe wood is used for furniture, boat building, and bridges[266].

dwatta MiscellanyThis plant is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. The stem bark is used in the treatment of ringworm[218]. The bark shows fungicidal activity against the parasitic Epidermophyton and Trichophyton fungi that cause ringworm[218].

propta Seed - sow late winter in a cold greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Landscape Uses:Border, Pest tolerant, Specimen. Best grown in a warm sheltered site on a deep fertile soil with a pH between 5 and 6 and an annual rainfall of around 1000mm[200]. Plants dislike dry winds and soils that dry out readily[200]. Slow-growing[11]. A difficult tree to grow well in cool temperate regions, if planted out when small it is easily scorched and can be killed by temperatures of -5°C[200]. In Britain good trees are only found in the southern part of the country[200]. Plants prefer a continental climate with hot summers - they are then much hardier and tolerate cold winters[200]. Best planted out when 30 - 80cm tall, it needs to be kept weed free until established and might require winter protection for its first few years[200]. There are several named forms, selected for their ornamental value[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

## 6.2.617 *Carpinus betulus*

Hornbeam, European hornbeam, Common Hornbeam, European Hornbeam

5 tlin 7 cyuc 0 kcak 0 tcan 2 dwat 25 m hkuc

pcimhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flat-prikliwsslip hpa7tmwatli hjonli

drutta *Carpinus betulus* is a deciduous Tree growing to 25 m (82ft) by 20 m (65ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Dye Fuel Hedge Hedge WoodPlants can be grown as a medium to tall hedge, they retain their dead leaves throughout the winter if clipped at least once a year in late summer[11, 29, 186]. They should not be clipped in spring since they will bleed profusely[200]. A yellow dye is obtained from the bark[115]. Wood - heavy, close grained, hard, very tough, very durable, not very durable according to another report. Used for flooring, cogs, tools, piano mechanisms etc[1, 11, 13, 46, 115]. A good fuel[6].

dwatta Bach Haemostatic OphthalmicThe leaves are haemostatic[7]. They are used in external compresses to stop bleeding and heal wounds[7]. A distilled water made from the leaves is an effective eye lotion[7]. The leaves are harvested in August and dried for later use[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Tiredness', 'Weariness' and 'Mental and physical exhaustion'[209].

propta Seed - best sown in an outdoors seedbed as soon as it is ripe[78]. Germination is usually good, though it may take 18 months[80]. If collected whilst still 'green' (after the seed is ripe but before it has dried fully on the plant) and sown immediately it should germinate in the following spring[80]. Grow the plants on for two years in the seedbed and then plant them out into their permanent positions in the winter. The average seed viability is around 65%[98]. Pre-treat stored seed with 4 weeks warm and 12 weeks cold stratification and sow in a cold frame[98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame until they are at least 15cm tall before planting them into their permanent positions.

nwatta Landscape Uses:Espalier, Pest tolerant, Hedge, Superior hedge, Specimen, Street tree. Thrives in any good loam, including chalk[1, 11], it does not demand much light[186]. Prefers a deep open loam[1] and does well on damp clays[186]. Succeeds in all but the most acid soils[186]. Dormant trees are very cold tolerant, the young growth is not usually damaged by late spring frosts[186]. The trees cast a deep shade[98, 186]. A very ornamental plant[1]. Trees are shallow-rooted[7]. The hornbeam has 28 species of associated insects[24]. Trees take 10 - 20 years from seed before they produce seed[98] and about 100 years to reach maturity[186]. At one time this tree was commonly pollarded or coppiced for its wood and for fuel[11, 13, 186]. Special Features: Not North American native, Inconspicuous flowers or blooms.

## 6.2.618 *Chamaecyparis lawsoniana*

Lawson Cypress, Port orford cedar, Oregon Cedar, Port Orford Cedar, Lawson's Cypress

5 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 25 m hkuc

hmimhtut cyutli hgatyuctcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwsslip hpa7tmwatli hjonli

drutta *Chamaecyparis lawsoniana* is an evergreen Tree growing to 25 m (82ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from March to April, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland)

or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Broom Hedge Resin WoodPlants can be grown as a tall hedge[29, 75, 200] They are very tolerant of clipping so long as this does not extend into the brown barked wood since trees cannot regenerate from this[200]. Any trimming should be done in the summer[200]. Certain dwarf forms can be used for ground cover, the cultivars 'Knowefieldensis', 'Nidiformis' and 'Tamariscifolia' have been recommended[208]. The branches have been used to make brooms[257]. Wood - very close-grained, hard, strong, durable, easily worked, light, abounding in fragrant resin, acid resistant. One of the world's finest timbers, it is widely used for flooring, fencing, making boats etc[46, 61, 82, 171]. It is now in short supply due to over-harvesting without replanting[200].

dwatta DiureticThe resin is a powerful diuretic[46, 61, 82].

propta Seed - sow March/April in a seedbed outdoors[78]. The seed is best sown in pots in a frame[K]. Seed can take 18 months to germinate. One month warm then one month cold stratification has produced good results[113]. When large enough to handle, prick the seedlings out into individual pots and grow them in a cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings in late summer or autumn in sandy soil in a cold frame[1, 11, 200]. Difficult, it may be best done in late winter to early spring[113].

nwatta Landscape Uses:Hedge, Screen, Specimen. Succeeds in most soils and situations, but prefers a moist deep loamy soil and a sheltered position[1, 11]. Grows well in heavy clay soils. Survives on dry alkaline soils[200]. Growth of trees is hardly affected by a lack of phosphate in the soil. Plants are moderately shade tolerant, especially when young[81, 200]. Plants are tolerant of atmospheric pollution according to one report[200], whilst another says that they do not do well in a polluted atmosphere[1]. A fairly wild tolerant plant, but it does not like severe maritime exposure[75]. Plants are susceptible to wind burn and recover variably[75]. This species is hardy to about -25°C[200]. A fairly long-lived tree in the wild with specimens 500 - 600 years old[229]. It is a very valuable timber tree in N. America and it is sometimes cultivated as a forestry tree in Britain, where it occasionally self-sows[1, 11]. It establishes well and grows quickly. New shoots can make 1 metre in a year but trees rarely maintain that rate and 30cm is nearer the average[185]. New growth starts very slowly in April, speeds up in June and ceases in September[185]. A very uniform species in the wild[200], in cultivation it is polymorphic and there are many named varieties[1, 185, 200]. The crushed foliage has a pungent smell[245]. Favoured by many birds for roosting, providing high cover and especially for nesting, large specimens of this tree help to attract songbirds to the garden[200]. Trees are notably susceptible to honey fungus[200]. Special Features: Attractive foliage, North American native, Inconspicuous flowers or blooms.

### 6.2.619 Fraxinus chinensis rhynchophylla

Hua Qu Liu

5 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 25 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Fraxinus chinensis rhynchophylla is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Weather protection WoodThe plant (extract?) is said to be used as a barrier to protect the skin from ultraviolet light[176]. The wood is used for cabinet making[266].

dwatta Analgesic Antiinflammatory Antitussive Astringent Diuretic Dysentery Expectorant StomachicThe bark is analgesic, anti-inflammatory, antitussive, astringent, diuretic, expectorant and stomachic[176, 218, 238]. It controls bacterial infections and coughs[238]. It is used in the treatment of apoplexy, liver diseases, diarrhoea, dysentery, eye diseases such as cataracts, cough and asthma[176, 279]. The bark contains aesculin, this has anti-inflammatory, anticoagulant and analgesic actions[176]. The bark also contains fraxetin. This has an inhibitory effect on the central nervous system, is a stronger and safer anodyne than aspirin and has some antibacterial activity[176].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[11, 200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. This sub-species grows well in Britain and is much more common in cultivation than *F. chinensis*[11, 200]. This species might be dioecious, in which case male and female plants must be grown if seed is required.

### 6.2.620 Cedrus atlantica

Atlas Deodar, Atlantic cedar

5 tin 9 cyuc 0 kcaak 3 tcan 2 dwat 25 m hkuc htut cyutli hgatkyuctup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

drutta Cedrus atlantica is an evergreen Tree growing to 25 m (82ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in September, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Essential Hedge Hedge Repellent WoodAn essential oil obtained from the distilled branches is used in perfumery, notably in jasmine-scented soaps[238]. The essential oil also repels insects[238]. Plants can be grown as a tall hedge[29]. Wood - fragrant and durable[238]. It is prized for joinery and veneer and is also used in construction[61, 238]. It is also used for making insect-repellent articles for storing textiles[238].

dwatta Antidandruff Antifungal Antiseptic Nervine Pectoral SkinAn essential oil obtained from the distilled branches is a good antiseptic and fungicide that stimulates the circulatory and respiratory systems and also calms the nerves[238]. The oil is also astringent, diuretic, expectorant and sedative[254]. Diluted with a carrier oil such as almond, and massaged into the skin it is used in the treatment of skin diseases, ulcers, chest infections, catarrh, cystitis and dandruff[4, 238, 254]. It is used as an inhaler for treating bronchitis, tuberculosis and nervous tension[4, 238]. An infusion of the branches can also be used[238].

propta Seed - collect the cones in winter and keep in a warm room until they open[1]. Sow immediately in a cold frame[78]. One report says that a short cold stratification of one month improves germination rates[113]. Keep the seed pot moist, but be careful because the young seedlings are

drutta Clematis douglasii is a deciduous Perennial growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Insulation Miscellany TinderThe seed floss makes an excellent tinder for starting fires, a spark from a flint will quickly ignite it[212]. The seed floss can be used as an insulation in shoes etc[212].

dwatta MiscellanyA decoction of the leaves has been used to treat headaches[257]. The root has been used in the treatment of congested nose pain[257].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Succeeds in any fertile well-drained soil in a sunny position[233]. Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1, 233]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 6.2.701 Goodyera repens

Creeping Lady's Tresses, Lesser rattlesnake plantain

5 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli kyuctup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli dyatxe7t hjonli

drutta Goodyera repens is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Humble bees. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta A cold infusion of the leaves has been used to improve the appetite and also in the treatment of colds and kidney problems[257]. A poultice of the wilted leaves has been used to 'draw out burns'[257]. The infusion can be held in the mouth as a treatment for toothache[257]. The root and the leaves have been used in the treatment of bladder problems[257]. The roots and the leaves have been used in the treatment of stomach problems and female disorders[257]. A poultice of the chewed leaves, and the swallowed juice, has been used in the treatment of snake bites[257]. The plant ooze has been used as drops to treat sore eyes[257].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able

to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move.

nwatta Requires a somewhat shady site and a well-drained compost of peat, leafmold and sand[1]. Does well in the woodland garden[42, 230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230].

### 6.2.702 Erysimum repandum

Bushy Wallflower, Spreading wallflower  
5 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli kyuctup hwicli hyhisrasljutnyik hpa7tli prikliw hpa7tmwatli xre7t hjonli

drutta Erysimum repandum is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antiscorbatic FebrifugeThe plant is used in Spain as an antiscorbatic[240]. The seeds are used in the treatment of fevers[240].

propta Seed - sow spring in situ[200]. Germination should take place within 3 weeks. The flowering season can be extended by making a succession of sowings from spring to early summer[200]. An autumn sowing should overwinter in many parts of the country and would provide flowering plants in the spring.

nwatta Requires a position in full sun in a well-drained approximately neutral soil[200]. Acid soils should be given some lime[200]. Plants are generally tolerant of poor soils[200].

### 6.2.703 Pinellia tripartita

5 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Pinellia tripartita is a CORM growing to 0.5 m (1ft 8in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antiemetic Antitussive Cardiotonic Diuretic ExpectorantThe root is antiemetic, antitussive, cardiotonic, diuretic, expectorant[218].

propta Seed - we have no information but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division as new growth begins in spring. Bulbils from the leaf axils.

nwatta Easily grown in a rich soil, it requires plenty of water in the growing season[1]. Succeeds in full sun or partial shade[188]. Plants can be naturalized in woodland[1]. Plants produce bulbils in their leaf axils[188].

### 6.2.704 Aristolochia macrophylla

Pipevine, Dutchman's Pipe

5 tin 8 cyuc 0 kcaak 0 tcan 1 dwat m hkuc

considered to be useful in the treatment of coughs and rickets in children[4]. It was at one time used as a herbal remedy for rickets[219] and its tannin content renders it suitable for stopping bleeding from small wounds[7]. The fronds are harvested in late spring and dried for later use[7].

propta Spores - best sown as soon as they are ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Germinates in spring[1]. Spring sown spores germinate in 1 - 3 months at 15°c[134]. Pot on small clumps of plantlets into individual pots as soon as they are large enough to handle and grow them on in light shade in a cold frame or greenhouse. Keep the plants humid until they are well established. Once the plants are 15cm or more tall, plant them out into their permanent positions in the spring. Division in spring.

nwatta Requires a well-drained position and lots of old mortar rubble in the soil[1]. Requires a humid atmosphere and some shade[28, 31]. A good plant for growing on a shady part of an old dry-stone or brick wall[K], also succeeding in full sun[219]. A very ornamental fern[1], it is very tough but slow to establish[219]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 6.2.697 Senecio erucifolius

Hoary Groundsel, Hoary ragwort

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc htuc cyutli kyuctcup hwicli hrasljutnyik frip hpa7tli flatprikliwisslip hpa7tmwatli fyifxre7t hjonli

drutta Senecio erucifolius is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta None known

dwatta Anthelmintic Antiscorbutic Diaphoretic Diuretic Emmenagogue Poultrice PurgativeThe plant is used in plasters, ointments and poultices[4]. This species is related to groundsel, *S. vulgaris*, and is said to have similar properties[4]. These are:- The whole herb is anthelmintic, antiscorbutic, diaphoretic, diuretic, emmenagogue and purgative[4, 9, 21, 54]. It is often used as a poultice and is said to be useful in treating sickness of the stomach, whilst a weak infusion is used as a simple and easy purgative[4]. The plant can be harvested in May and dried for later use, or the fresh juice can be extracted and used as required[4]. Use with caution[21], see notes above on toxicity.

propta Seed - sow spring in situ. Division in spring.

nwatta We have very little information on the cultivation needs of this plant but, judging by its native habitats, it is likely to require a sunny position and to succeed in most moderate to heavy soils, including those of an alkaline nature[K].

### 6.2.698 Helianthemum nummularium

Common Rockrose, Sun Rose, Rock Rose

5 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Helianthemum nummularium is an evergreen Shrub growing to 0.5 m (1ft 8in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta A prostrate growing plant, it can be used as a ground cover[11].

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Terror', 'Panic' and 'Extreme fright'[209]. It is also one of the five ingredients in the 'Rescue remedy'[209].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 6 - 8cm with a heel, late summer in a sandy soil in a frame[200].

nwatta Landscape Uses:Alpine garden, Border, Ground cover, Rock garden, Specimen. Requires an open sunny position in a light well-drained soil with a pH between 5.5 and 8[200]. Plants are hardy to at least -10°c[200]. A vigorous plant suitable for the rock garden, crevices in walls or gravel beds[200]. Plants are short-lived, though, soon becoming leggy or sparse, and require fairly frequent replacement[200]. The flowers only open in bright sunshine[200]. Plants resent root disturbance and should be placed in their permanent positions as soon as possible[200]. A polymorphic species[11], there are some named forms that have been selected for their ornamental value[200]. Plants are generally pest and disease-free[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Not North American native, Attracts butterflies.

### 6.2.699 Lithospermum erythrorhizon

Lithospermum

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.7 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lithospermum erythrorhizon is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta DyeA purple dye is obtained from the root[46, 61, 218]. It is harvested in the spring[178]. It is much liked but the colour is fugitive and production costs high[174].

dwatta Antitumor Contraceptive Depurative Eczema Febrifuge SalveAll parts of the plant are antitumor, cardiotoxic, contraceptive, depurative and febrifuge[147, 174, 176, 218, 238]. It is used internally in the treatment of irritant skin conditions, measles, chicken pox, boils, carbuncles, hepatitis and skin cancer[238]. Externally it is used to treat nappy rash, burns, cuts, wounds, abscesses, eczema and haemorrhoids[147, 174, 176, 218, 238]. The plant is an ingredient of commercial skin care creams[238]. The plants are harvested when in flower; the roots in the autumn[238]. They are dried for later use[238].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division in the autumn[238].

nwatta Requires a warm sunny position in a moderately fertile well-drained soil[1, 200]. Prefers a neutral to alkaline soil and also succeeds in partial shade[238]. Plants are hardy to at least -15°c[238]. This species is cultivated in Japan[46] (as a dye plant?).

### 6.2.700 Clematis douglasii

Hairy Clematis

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

very prone to damp off, keep them well ventilated[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a cold frame for their first winter and plant them out into their permanent positions in late spring or early summer. Give them some protection from winter cold for their first winter or two outdoors[K]. Cuttings of terminal shoots can be tried in a frame in November but they are very difficult[113].

nwatta Thrives on most soils, being very tolerant of chalk, dry sites and of drought when it is established[11, 81, 200]. Prefers a rich loam or a sandy clay in full sun[1]. This species is more tolerant of atmospheric pollution than other members of the genus[11]. Succeeds in warm dry areas with less than 40cm of rain a year, but also in areas with cool summers and up to 200cm of rain[200]. Small trees less than 50cm tall establish much quicker and better than taller trees, those more than 2 metres tall are difficult to establish[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Trees grow fairly rapidly, with height gains of 60cm in a year recorded[185]. This species is cultivated for its timber in some parts of S. Europe[50]. Small male cones are formed on the lower branches of trees, whilst the larger female cones are formed on higher branches[238]. These female cones persist on the tree for 2 - 3 years before breaking up[238]. Trees are notably susceptible to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

### 6.2.621 Betula utilis

Indian Paper Birch, Whitebarked Himalayan Birch, Jacquemontii Birch

5 tlin 6 cyuc 0 kcaak 3 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik frip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Betula utilis is a deciduous Tree growing to 20 m (65ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower in April, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta Incense Paper Waterproofing WoodA paper is made from the inner bark[46, 51, 61]. The outer bark can be carefully peeled off the tree (this does not harm the tree) and used as a paper[158]. The outer bark can also be used as a waterproofing and for roofing houses[51, 146, 272]. The bark is sometimes used as an incense[272]. Wood - tough, even grained, moderately hard, elastic. Used for construction[51, 146, 158, 272].

dwatta Antiseborrheic Antiseptic Carminative UrinaryAn infusion of the bark is antiseptic and carminative[240, 243, 272]. It has been used in the treatment of hysteria and jaundice[240, 243, 272]. It is applied as drops to the ears to relieve earache[272]. A paste made from the bark is used as a poultice on cuts, wounds and burns[272]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Betula species for infections of the urinary tract, kidney and bladder stones, rheumatism (see [302] for critics of commission E).

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[78, 80, 113, 134]. Only just cover the seed and place the pot in a sunny position[78, 80, 134]. Spring sown seed should be surface sown in a sunny position in a cold frame[113, 134]. If the germination is poor, raising the temperature by covering the seed with glass can help[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If you have sufficient seed, it can be

sown in an outdoor seedbed, either as soon as it is ripe or in the early spring - do not cover the spring sown seed. Grow the plants on in the seedbed for 2 years before planting them out into their permanent positions in the winter[78, 80, 113, 134].

nwatta Landscape Uses:Specimen. Succeeds in a well-drained loamy soil in a sheltered position[11, 200]. Grows well in heavy clay soils. Dislikes wet soils[200]. Shade tolerant[200]. Plants are showing good wind-resistance on our Cornish trial ground[K]. Hybridizes freely with other members of this genus[50]. A good plant to grow near the compost heap, aiding the fermentation process[200]. Trees are notably susceptible to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 6.2.622 Cryptomeria japonica

Japanese Cedar, Sugi

5 tlin 8 cyuc 0 kcaak 0 tcan 1 dwat 20 m hkuc htuc cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta Cryptomeria japonica is an evergreen Tree growing to 20 m (65ft) by 8 m (26ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from February to March, and the seeds ripen from October to March. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta Incense Shelterbelt WoodThe leaves are very aromatic and are used as incense sticks[46, 61, 272]. A fairly wind-tolerant tree, it can be used in shelterbelt plantings[200]. Wood - light, fragrant, fine grained[46, 61]. The wood is strongly rot resistant, easily worked, and is used for buildings, bridges, ships, lamp posts, furniture, utensils, and paper manufacture[1, 46, 61, 266]. The wood can be used as a substitute for Deal[146]. Old wood that has been buried in the soil turns a dark green and is then much esteemed[46, 61].

dwatta Depurative VDAAn oil and/or a resin from the plant is depurative and also used in the treatment of gonorrhoea[218].

propta Seed - sow early spring in a cold frame. The seed germinates better if given a short cold stratification for 2 - 3 weeks at 4°c and is then placed in a warm position[164]. Germination usually takes place within 3 - 9 weeks at 15°c[164]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. An alternative is to plant out the young trees into an outdoor nursery bed when they are about 8cm tall and grow them on for a couple of years before planting them into their permanent positions in late autumn or early spring[164]. Cuttings in the autumn in a sandy soil in a cold frame.

nwatta Landscape Uses:Screen, Specimen, Street tree. Prefers a deep rich moist alluvial soil and a sheltered position in full sun[1, 11, 164]. Tolerates very acid to somewhat alkaline soils, but becomes chlorotic on shallow soils over chalk[200]. Plants are fairly wind-tolerant[200]. A very ornamental tree[1], it has been widely cultivated as a forestry tree for several centuries in Japan and there are many strains each adapted to the various local conditions[11]. Many forms, almost all of them dwarf, have also been selected for their ornamental value[185, 200]. A fast-growing tree on deep, well-drained soils in montane areas with a warm, moist climate, but intolerant of poor soils and cold, drier climates[266]. Occasionally planted for timber in Europe[50], trees do not generally do as well as could be expected in Britain, the best specimens are to be found in the west, especially in the south-west[11]. Trees can grow quite fast in the western part of the country with annual increases of 1 metre or more[185]. New growth takes place from early June to August[185]. Growth decreases rapidly with age, virtually ceasing when the tree reaches 25 metres[185]. This species is no-

tably resistant to honey fungus[200]. Unlike most conifers, this species can be coppiced[81]. Special Features: Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 6.2.623 Fraxinus latifolia

Oregon Ash

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 20 m hkuc htut cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Fraxinus latifolia is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Shelterbelt WoodA fairly wind resistant tree, it can be grown as part of a shelterbelt planting[200]. Wood - hard, brittle, light, coarse grained. A valuable timber tree, it is largely used for making furniture, the interiors of buildings, cooperage etc, and as a fuel[46, 61, 82, 171].

dwatta Anthelmintic Febrifuge VulneraryThe pulverised fresh roots were used by some native North American Indian tribes to treat serious wounds[213, 257]. A cold infusion of the twigs has been used to treat fevers[257]. The bark is anthelmintic[257].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are grass feeders and require a rich soil[11, 200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. A fast growing tree for its first 75 years in the wild, it then grows slowly reaching a maximum age of 250 years[229]. This species is closely related to *F. pennsylvanica*[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.624 Catalpa bignonioides

Indian Bean Tree, Southern catalpa

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 15 m hkuc htut cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Catalpa bignonioides is a deciduous Tree growing to 15 m (49ft) by 12 m (39ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from June to July, and the seeds ripen from October to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta WoodA fast-growing tree with an extensive root system, it has been planted on land that is subject to landslips or erosion in order to stabilize the soil[7]. Wood - coarse and

straight-grained, soft, not strong, moderately high in shock resistance, very durable in the soil. It weighs about 28lb per cubic foot. It is highly valued for posts and fencing rails, and is also used for interior finishes, cabinet work etc[46, 61, 82, 227].

dwatta Antidote Antiseptic Cardiac Laxative Malaria Ophthalmic Sedative VermifugeA tea made from the bark has been used as an antiseptic, antidote to snake bites, laxative, sedative and vermifuge[222]. As well as having a sedative effect, the plant also has a mild narcotic action, though it never causes a dazed condition[7]. It has therefore been used with advantage in preparations with other herbs for the treatment of whooping cough in children, it is also used to treat asthma and spasmodic coughs in children[7, 254]. The bark has been used as a substitute for quinine in treating malaria[254]. The leaves are used as a poultice on wounds and abrasions[222]. A tea made from the seeds is used in the treatment of asthma and bronchitis and is applied externally to wounds[222]. The pods are sedative and are thought to have cardioactive properties[222]. Distilled water made from the pods, mixed with eyebright (*Euphrasia officinalis*) and rue (*Ruta graveolens*) is a valuable eye lotion in the treatment of trachoma and conjunctivitis[7].

propta Seed - best sown outdoors, or in a cold frame, as soon as it is ripe[200]. Stratify stored seed for 3 weeks at 1°C and sow in spring[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Softwood cuttings, 10cm long, in a frame. They should be taken in late spring to early summer before the leaves are fully developed[200]. Root cuttings in winter[200].

nwatta Landscape Uses:Specimen, Street tree. Prefers a good moist loamy soil and a sunny position that is not exposed[1, 11]. Tolerates heavy clay soils[200]. Very resistant to atmospheric pollution[188]. Plants become chlorotic on shallow alkaline soils[202]. Plants are hardy to about -15°C, probably more in continental climates[200], they grow best in areas with hot summers[188]. Protect plants from late frosts when they are young[200]. A very ornamental plant[1], it is fast-growing in the wild where it often flowers when only 6 - 8 years old[229]. The sweetly-scented flowers are borne in forked panicles at the end of branches[245]. There are some named varieties selected for their ornamental value[188, 200, 202]. The trees transplant easily[200]. The crushed foliage has an unpleasant smell[202]. Another report says that the leaves are attractively scented when bruised[245]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Naturalizing, All or parts of this plant are poisonous, Blooms are very showy.

## 6.2.625 Hedera helix

Ivy, English ivy, Algerian ivy, Baltic Ivy, Common Ivy

5 tlin 11 cyuc 0 kcak 4 tcan 3 dwat 15 m hkuc pcmhmmhtut cyutli hgattcuphja7n hwicli hyishrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Hedera helix is an evergreen Climber growing to 15 m (49ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from October to November, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Although they are almost certainly not edible, there is a report that the seeds contain 16.2% protein and 35.1% fat[218].

tcanta Dye Hair Hedge Hedge Parasiticide Pollution Soap WoodA yellow and a brown dye are obtained from the twigs[46, 61]. A decoction of the leaves is used to restore black fabrics[7, 46, 53] and also as a hair rinse to darken

propta Seed - sow May/June in a cold frame. The seed usually germinates in 2 - 3 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer or autumn[1]. The seed can also be sown thinly in an outdoor seedbed in late spring, the young plants being planted out in late spring or the autumn[1]. Cuttings of half-ripe shoots, July in a frame[1]. Division in September[1]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Rock garden. Prefers a rich well-drained loamy neutral to alkaline soil in a sunny position[1, 238], but succeeds in most soils including dry ones[1]. A very ornamental plant[1], it is usually biennial in habit, but can be a short-lived perennial. There are many cultivars that are widely grown in gardens. Since these flower freely in their first year and then degenerate, they are usually treated as annuals[200]. A very variable species in the wild, it has often been subdivided into up to eight different varieties[266]. Special Features:Attractive foliage, Naturalizing, Suitable for cut flowers, Fragrant flowers, Attractive flowers or blooms.

## 6.2.694 Magnolia macrophylla

Bigleaf Magnolia

5 tlin 8 cyuc 0 kcak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Magnolia macrophylla is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant is not wind tolerant. It can tolerate atmospheric pollution.

kcakta None known

tcanta WoodWood - soft, light, not strong, close-grained. Used for flooring, cabinet making etc[61]. The wood is hard but weak according to another reports, which say that it is not used commercially[82, 229]. The wood weighs 33lb per cubic foot[235].

dwatta Odontalgic StomachicAn infusion of the bark has been used in the treatment of stomach aches or cramps[257]. A hot infusion of the bark has been snuffed for treating sinus problems and has been held in the mouth for treating toothache[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Firewood, Pest tolerant, Specimen. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Dislikes limey soils[11]. Prefers a neutral to acid soil but tolerates alkaline soils so long as they are deep and rich in humus[188]. The branches are brittle and the leaves very large, so a sheltered position is required[200, 229]. Very tolerant of atmospheric pollution[200]. Dormant mature plants are hardy to about -20°C[200] but the plants are apt to be damaged by late frosts when they are young[1]. Trees are slow-growing in the wild[229] and do not commence flowering until they are mature[245]. The leaves are very large and can be up to 80cm long by 25cm wide[229]. The flowers are sweetly scented[229, 245]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. Special Features: Attractive foliage, North American native, Fragrant flowers, Blooms are very showy.

## 6.2.695 Helleborus viridis

Green Hellebore

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.3 m hkuc hmim cyutli tcup hwicli hrasjlutnykrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Helleborus viridis is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from February to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta ParasiticideA decoction of the roots is used as a parasiticide against body lice, fleas etc[76, 213]. This use is somewhat dangerous, see the notes above on toxicity. Plants are suitable for ground cover when spaced about 45cm apart each way[208].

dwatta Anthelmintic Antiemetic Cardiac Cathartic Diuretic Emetic Emmenagogue Hypotensive Irritant Narcotic Parasiticide PurgativeThe root is anthelmintic, cardiac, cathartic, diuretic, emetic, emmenagogue, irritant, violently narcotic and a drastic purgative[4, 9, 21, 46]. The dried root is used, it contains the alkaloids nervine, pseudo-nervine and veratridine[213]. It is best to harvest the root in the autumn[213]. The plant is useful for reducing blood pressure in various conditions of hypertension[213].

propta Seed - best sown as soon as it is ripe in a cold frame[1, 134]. Sow stored seed as early in the year as possible[1], it usually germinates in the autumn to spring. Seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This species produces flowering plants in 2 - 3 years from seed[200]. Division after flowering or in autumn. Take care since the plant resents disturbance[111, 200].

nwatta Cultivation of this plant is not always easy, it prefers a rich limy soil in partial shade[187]. One report says that the plant requires an alkaline soil[17]. Succeeds in any good garden soil[1], preferring a moist well-drained rich loam in a sheltered position in partial shade[1, 4, 31, 111]. Succeeds when grown in the shade of a north-facing wall[233]. Does not object to lime[1]. Grows well in heavy clay soils[200]. Dislikes drought. Slugs are very fond of this plant and it will probably require some protection from them[187]. The various species in this genus hybridize freely[95]. Plants resent root disturbance and should be placed in their permanent positions whilst still small[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.696 Asplenium ruta

Wall Rue, Lance asplenium

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.1 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli lwisslip hpa7tmwatli hjonli

drutta Asplenium ruta-muraria is an evergreen Fern growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, and the seeds ripen from July to October. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Astringent Deobstruent Emmenagogue Expecto-rant OphthalmicThe fronds are astringent, deobstruent, emmenagogue, expectorant and ophthalmic[4, 7, 240]. A distilled water made from the fronds has proved of benefit in the treatment of many eye complaints[7]. The plant is also



that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°c for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°c will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species requires a fairly dry site with good drainage[239]. Plants are intolerant of root disturbance[200]. A moisture loving plant, preferring to grow with full exposure to the sun but with plenty of underground moisture in the summer, it grows better in the north and west of Britain[1]. This species is closely related to *G. affinis*[239].

### 6.2.691 *Ajuga australis*

Australian Bugle

5 tin 9 cyuc 0 kcak 3 tcan 1 dwat 0.2 m hkuc htuc cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ajuga australis* is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcakta Plants can be used for ground cover[200].

dwatta *Salve*The leaves are used as a salve for wounds[238] and also in the treatment of boils and sores[152, 238].

propta Seed - sow spring or autumn in the open border[1]. Division in spring.

nwatta Prefers a humus-rich, moisture retentive soil and a sunny position[200]. Easily grown in the rock garden[1], it spreads rapidly by root suckers[157].

### 6.2.692 *Jeffersonia diphylla*

Twinleaf, Rheumatism Root

5 tin 8 cyuc 0 kcak 0 tcan 2 dwat 0.2 m hkuc pcmihmmi cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Jeffersonia diphylla* is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full

shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antispasmodic Cancer Diuretic Emetic Expecto-rant Poulrice Tonic UrinaryThe whole plant is antispasmodic, diuretic, emetic, expectorant and tonic[21, 46, 218, 222]. An infusion is used in the treatment of diarrhoea, dropsy, gravel and urinary problems[257]. The root is emetic in large doses and expectorant in smaller doses[207]. The root contains berberine, which has been shown to have anti-tumour activity[218]. A poultice of the plant is applied to sores, ulcers and inflamed parts[257].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Sow stored seed as soon as possible in late winter or the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in early spring[200].

nwatta Landscape Uses:Rock garden, Woodland garden. Prefers a light sandy, peaty or humus-rich woodland soil and a rather shady situation[1, 130, 280]. Suitable for a choice position in a cool leafy soil[187]. Plants are hardy to at least -20°c[187]. A slow-growing plant[188]. Plants have an extensive root system and resent disturbance[188]. They should be pot-grown and planted into their permanent positions as soon as possible. Special Features:North American native, Attractive flowers or blooms. The plant is heat tolerant in zones 7 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 6.2.693 *Dianthus chinensis*

Chinese Pink, Rainbow pink, Annual Pink, China Pink

5 tin 8 cyuc 0 kcak 0 tcan 3 dwat 0.7 m hkuc htuc cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Dianthus chinensis* is a PERENNIAL growing to 0.7 m (2ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Anthelmintic Antibacterial Antiphlogistic Diaphoretic Diuretic Emmenagogue Febrifuge Haemostatic Ophthalmic Tonic UrinaryThe Chinese pink has been used for over 2,000 years in Chinese herbal medicine[238]. The whole plant is a bitter tonic herb that stimulates the digestive and urinary systems and also the bowels[238]. It is also anthelmintic, antibacterial, antiphlogistic, diaphoretic, diuretic, emmenagogue, febrifuge and haemostatic[218, 238, 279]. It is used internally in the treatment of acute urinary tract infections (especially cystitis), urinary stones, constipation and failure to menstruate[238]. It is used externally to treat skin inflammations and swellings[238]. The old leaves are crushed and used for clearing the eyesight[218]. The plants are harvested just before the flowers open and are dried for later use[238].

the hair[7, 53]. If the leaves are boiled with soda they are a soap substitute for washing clothes etc[61]. An excellent ground cover for shady places, succeeding even in the dense shade of trees[197, 208]. A very effective weed suppresser[190]. The cultivars 'Hibernica', 'Lutzi' and 'Neilsonii' have been especially mentioned[190]. Plants can be grown along fences to form a hedge. The variety 'Digitata' is very useful for this[200]. Plants have been grown indoors in pots in order to help remove toxins from the atmosphere. It is especially good at removing chemical vapours, especially formaldehyde[259]. The plants will probably benefit from being placed outdoors during the summer[259]. The wood is very hard and can be used as a substitute for *Buxus sempervirens* (Box), used in engraving etc[46, 61]. Another report says that the wood is very soft and porous and is seldom used except as a strop for sharpening knives[4].

dwatta Antibacterial Antirheumatic Antiseptic Antispasmodic Astringent Cathartic Diaphoretic Emetic Emmenagogue Parasitice Skin Stimulant Vasoconstrictor Vasodilator VermifugeIvy is a bitter aromatic herb with a nauseating taste[238]. It is often used in folk herbal remedies[218], especially in the treatment of rheumatism and as an external application to skin eruptions, swollen tissue, painful joints, burns and suppurating cuts[9, 238]. Recent research has shown that the leaves contain the compound 'emetine', which is an amoebicidal alkaloid, and also triterpene saponins, which are effective against liver flukes, molluscs, internal parasites and fungal infections[238]. The leaves are antibacterial, antirheumatic, antiseptic, antispasmodic, astringent, cathartic, diaphoretic, emetic, emmenagogue, stimulant, sudorific, vasoconstrictor, vasodilator and vermifuge[7, 218, 238]. The plant is used internally in the treatment of gout, rheumatic pain, whooping cough, bronchitis and as a parasiticide[238]. Some caution is advised if it is being used internally since the plant is mildly toxic[7]. Excessive doses destroy red blood cells and cause irritability, diarrhoea and vomiting[238]. This plant should only be used under the supervision of a qualified practitioner[238]. An infusion of the twigs in oil is recommended for the treatment of sunburn[4]. The leaves are harvested in spring and early summer, they are used fresh and can also be dried[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Hedera helix* for cough, bronchitis (see [302] for critics of commission E).

propta Seed - remove the flesh, which inhibits germination, and sow the seed in spring in a cold frame[113]. Four weeks cold stratification will improve germination[113]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the cold frame for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a shady position in a frame. Good percentage[78]. Cuttings of mature wood, 12cm long, November in a cold frame[78]. Layering. Plants often do this naturally.

nwatta Landscape Uses:Cascades, Container, Erosion control, Ground cover, Massing. Ivy is a very easily grown plant that dislikes waterlogged, very dry or very acid soils but otherwise succeeds in all soil types[1, 17, 238]. It grows well in heavy clay soils. Prefers some lime in the soil. Tolerates very dense shade[24, 31], though it may not flower in such a position[K]. The plant is very hardy and tolerant of atmospheric pollution[4]. Established plants are drought tolerant[190]. A very ornamental and hardy plant[190], it tolerates temperatures down to about -25°c[184]. There are many named varieties[190], the variegated forms are less hardy than the species and also require more light[238]. Ivy is a rampant climbing plant, clinging by means of aerial roots and often trailing on the ground in woods and hedges[186]. It is of benefit rather than harm when growing on a wall because it keeps the wall dry and acts as an insulation[11, 24]. It does not damage the structure of a wall. Similarly, it does not harm large trees when climbing into them, though it can shade out smaller and ailing trees[200]. It is not a parasitic plant, but instead obtains all its nutrient from the sun and the soil[186]. A very good plant for wild-life, it provides dense shelter for birds, spiders etc, an abundant late supply of nectar for insects and a supply of seeds for winter food[4, 24, 186]. It is a food plant for the larvae of many species of butterfly[24, 30]. A very variable plant, there are many named varieties. This species is notably resistant to honey fungus[200]. Special Features: Attractive foliage, Not North

American native, Naturalizing, All or parts of this plant are poisonous, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

### 6.2.626 *Acer caesium*

5 tin 9 cyuc 0 kcak 0 tcan 1 dwat 15 m hkuc hmimhttu cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Acer caesium* is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcakta Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. Wood - close grained, soft to moderately hard. Occasionally used for carving, bowls, cups etc[146, 158].

dwatta AstringentThe juice of the bark is used externally in Nepal to treat muscular swellings, boils and pimples[272].

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°c. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter.

nwatta Of easy cultivation, it prefers a good moist well-drained soil in a sunny position but tolerates some shade. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. This species is closely related to *A. giralduii*[11].

### 6.2.627 *Catalpa bungei*

5 tin 9 cyuc 0 kcak 0 tcan 2 dwat 10 m hkuc hmimhttu cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Catalpa bungei* is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcakta WoodWood - hard, excellent quality. Used for printing blocks, chess tables etc[174, 178].

dwatta Anthelmintic Poulrice StomachicThe stem bark is made into a lotion for cancer[218]. It is also anthelmintic

and stomachic[178, 218]. The leaf, stem bark and the seeds are all used as dressings for sores, boils etc[218].

propta Seed - best sown outdoors, or in a cold frame, as soon as it is ripe[200]. Stratify stored seed for 3 weeks at 1°c and sow in spring[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Softwood cuttings, 10cm long, in a frame. They should be taken in late spring to early summer before the leaves are fully developed[200]. Root cuttings in winter[200].

nwatta Prefers a good moist loamy soil and a sunny position that is not exposed[1, 11]. Tolerates heavy clay soils. Very resistant to atmospheric pollution[188]. Plants are hardy to about -15°c, probably more in continental climates[200], they grow best in areas with hot summers[188]. Protect plants from late frosts when they are young[200]. Transplants easily[200]. There are some named varieties selected for their ornamental value[188]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.628 Fraxinus longicuspis

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 8 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Fraxinus longicuspis is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta InkA bluish indelible dye is produced by steeping the bark in water[178].

dwatta Astringent Tonic UrinaryAstringent. A tonic for the genito-urinary system[178].

propta The seed is best harvested green - as soon as it is fully developed but before it has fully dried on the tree - and can then be sown immediately in a cold frame[80]. It usually germinates in the spring[80]. Stored seed requires a period of cold stratification and is best sown as soon as possible in a cold frame[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out into their permanent positions or a nursery bed in late spring or early summer of the following year. If you have sufficient seed then it is possible to sow it directly into an outdoor seedbed, preferably in the autumn. Grow the seedlings on in the seedbed for 2 years before transplanting either to their permanent positions or to nursery beds.

nwatta Prefers a deep loamy soil, even if it is on the heavy side[1, 200]. Most members of this genus are gross feeders and require a rich soil[11, 200]. Plants succeed when growing in exposed positions[200] and also in alkaline soils[11]. They tolerate atmospheric pollution[200]. This species is closely related to *F. chinensis*[11]. There is some confusion over the correct name for this species. The information was gathered under the name *F. pubinervis* which, according to [11] is a synonym for *F. longicuspis* Sieb. and Zucc. However, [200] says that *F. pubinervis* a synonym for *F. sieboldiana* and that *F. longicuspis* Hort. is also a synonym of *F. sieboldiana*. This species might be dioecious, in which case male and female plants must be grown if seed is required.

## 6.2.629 Clematis connata

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Clematis connata is a deciduous Climber growing to 7 m (23ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light

(sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta MiscellanyNone known  
dwatta MiscellanyThe juice of the plant is inhaled to relieve sinusitis[272].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°c[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Requires a warm, sheltered sunny position and plenty of water during the growing season[273]. Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Succeeds in acid as well as alkaline soils[200]. When planting out, in order to avoid the disease ‘clematis wilt’, it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. A very vigorous plant, with new shoots extending up to 6 metres in a season. It can be rather invasive[273]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants flower on the current seasons growth. They often require no pruning, especially if left to clamber into large shrubs and trees. Weak or dead stems can be removed in the winter and, where pruning may be required to reduce the size of the plant, shoots can be cut back by up to two thirds in the winter[273]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.630 Cotoneaster bacillaris

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 5 m hkuc hmimhtut cyutli kyucutop hwicli hyishrasjlutnyikfrip hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

drutta Cotoneaster bacillaris is a deciduous Shrub growing to 5 m (16ft 5in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Dye WoodA rose-tan dye is obtained from the fruit[168]. Wood - very hard, elastic, close and even grained but splits and warps easily. Too small for many purposes but the branches are used for making walking sticks, agricultural implements etc[11, 146, 158].

dwatta AstringentThe stolons are said to be astringent[240].

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°c and then 3 months cold stratification at 4°c[164]. The seed usually germinates within 1 - 18 months at 15°c but it can take 2 years[164]. Pot

## 6.2.687 Coptis chinensis

Huang Lian  
5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Coptis chinensis is an evergreen Perennial growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from February to March, and the seeds ripen from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known  
tcanta DyeA bright yellow pigment found in the roots can be used for dyeing[238]. Can be grown as a ground cover plant in the peat garden[200].

dwatta Anaesthetic Analgesic Antibacterial Antidote Antipyretic Antispasmodic Bitter Blood tonic Carminative Cholagogue Digestive Dysentery Sedative Skin Stomachic Tonic VasodilatorHuang Lian is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. The root is a pungent, very bitter, cooling herb that controls bacterial and viral infections, relaxes spasms, lowers fevers and stimulates the circulation[238]. It is one of the most frequently used herbs in prescriptions for the treatment of diabetes mellitus[218]. The root is analgesic, locally anaesthetic, antibacterial, antidote, antipyretic, bitter, blood tonic, carminative, cholagogue, digestive, sedative, stomachic, tonic and vasodilator[46, 61, 147, 176]. It is particularly helpful in the treatment of diarrhoea, acute enteritis and dysentery, whilst it is also used in the treatment of insomnia, fidget, delirium due to high fever, leukaemia and otitis media[176]. Externally it is used to treat various skin problems such as acne, boils, abscesses and burns whilst it is also used as a gargle for mouth and tongue ulcers, swollen gums and toothache[254]. As an eyewash it is used to treat conjunctivitis[254]. The root is harvested in the autumn and used fresh or dried[238].

propta Seed - best sown in a greenhouse as soon as it is ripe in an ericaceous compost[164]. Seal the pot in a polythene bag until germination takes place, which is usually within 1 - 6 months at 10°c[164]. Stored seed should be sown as early in the year as possible. Four weeks cold stratification may be beneficial[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least their first winter. Plant them out in mid-autumn or in spring. Division in spring[200].

nwatta Succeeds in a light moist humid-rich slightly acidic soil with a northerly aspect or light shade[1, 200]. Plants are hardy to at least -15°c[238].

## 6.2.688 Ageratina occidentalis

Western Snakeroot  
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyixre7t hjonli

drutta Ageratina occidentalis is a PERENNIAL growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta AntirheumaticThe plant is used externally in the treatment of rheumatism and swellings[254, 257].

propta Seed - sow spring in a cold frame, only just covering the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Succeeds in an ordinary well-drained but moist-retentive garden soil in sun or part shade[200].

## 6.2.689 Delphinium semibarbatum

Zalil  
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Delphinium semibarbatum is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Anodyne Detergent Diuretic PoulticeThe plant is considered to be anodyne, detergent and diuretic[240]. It is used in the treatment of jaundice, dropsy and troubles of the spleen[240]. It is used externally as a poultice for swellings[240].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°c[200]. Temperatures above 15°c inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°c[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Prefers a rich well-drained soil that stays moist in the summer[111, 187]. Dislikes water-logged soils[200], it is liable to die out in heavy soils over winter[111]. Requires an open sunny position[188]. This species is not reliably hardy in cool temperate zones[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.690 Gentiana puberulenta

Downy gentian  
5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Gentiana puberulenta is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Antidote Appetizer Bitter Digestive Stomachic TonicThe root is said to be an antidote to snakebites[61]. This *N. American* species has medicinal properties practically identical with the European gentians[4]. The following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[*K*]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is antihelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient quantity the seed can be sown outdoors in situ in the autumn or the spring. Division in autumn or spring[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Easily grown in a moderately fertile moisture retentive well drained soil[200]. Prefers cool summers[200]. Prefers a sunny position[188].

## 6.2.684 *Salvia multiorrhiza*

Dan Shen

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat m hkuc htut cyutil kyuctcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Salvia multiorrhiza* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: None known tcanta None known

dwatta Adaptogen Alterative Anticholesterolemic Antirheumatic Antiseptic Antispasmodic Astringent Cancer Emmenagogue Hepatic Sedative Tonic VulneraryDan Shen has long been used in Chinese medicine and recent research has confirmed the validity of its use in the treatment of heart and circulatory problems[254]. The root is adaptogen, alterative, anticholesterolemic, antirheumatic, antiseptic, antispasmodic, astringent, emmenagogue, hepatic, sedative, tonic and vulnerary[147, 176, 178, 218]. It acts mainly on the heart energy, removing excess heat and clearing stagnation[238]. Its use improves the micro-circulation, increases blood flow to the coronary artery, improves myocardial contraction and adjusts the heart rate[176]. It has an antibacterial action, inhibiting the growth of *Pseudomonas*, *E. coli*, *Vibrio Proteus*, *Bacillus typhi*, *Shigella dysenteriae*, *Shigella flexneri*, *Staphylococcus aureus* etc[176]. It is used internally in the treatment of coronary heart disease, poor circulation, palpitations, irritability, insomnia, breast abscesses, mastitis, ulcers, boils, sores, bruises, menstrual problems and post-natal pains[238]. 'Praised for its alleged medicinal qualities, including a cure for cancer'[187]. The roots are harvested in the autumn and early winter and are dried for later use[238].

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants can be killed by excessive winter wet[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 6.2.685 *Salix miyabeana*

5 tlin 9 cyuc 0 kcaak 3 tcan 2 dwat m hkuc htut cyutil tcuphja7n hwicli hrasljutnykrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix miyabeana* is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy

clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta Basketry FodderThe stems are very flexible and are occasionally used in basket making[199]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Fodder: Bank Industrial Crop: Biomass Manage Coppice Other Systems: SRC Regional CropSucceeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. This species is very closely related to *S. purpurea*[11, 199]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 6.2.686 *Atractylodes macrocephala*

Bai Zhu

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat m hkuc hmimhtut cyutil tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta *Atractylodes macrocephala* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antibacterial Diuretic Sedative Stomachic TonicBai Zhu is widely used in traditional Chinese medicine[238]. The root contains an essential oil, glucoside and inulin[283]. It is a bitter-sweet tonic herb that acts mainly upon the digestive system and strengthens the spleen[238, 254]. The root is antibacterial, diuretic, hypoglycaemic, sedative, stomachic and tonic[176, 238]. It is used in the treatment of poor appetite, dyspepsia, abdominal distension, chronic diarrhoea, oedema and spontaneous sweating[176]. It is often used in conjunction with other herbs such as *Codonopsis tangshen* and *Glycyrrhiza uralensis*[238]. Combined with *Baical skullcap* (*Scutellaria baicalensis*) it is used to prevent miscarriage[254]. The roots are harvested in the autumn and baked for use in tonics[238].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in the following spring or early summer.

nwatta Succeeds in any well-drained soil in sun or partial shade[238]. This species is probably hardy in most of Britain, it tolerates temperatures down to at least -15°C[238]. Widely cultivated in China for its use as a medicinal herb[238, 266]. This species is dioecious. Both male and female plants need to be grown if seed is required[266].

the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

nwatta A vigorous and easily grown plant[1], it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Tolerates atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. A very ornamental plant[1]. Trees are notably susceptible to honey fungus[200].

## 6.2.631 *Weigela japonica*

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 5 m hkuc hmimhtut cyutil tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Weigela japonica* is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Hedge HedgePlants can be grown as a hedge[178].

dwatta SalveSalve. Used as a wash for virulent sores[178].

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter or early spring. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Softwood basal cuttings, 10 - 12cm long, in a sandy soil in a cold frame in early summer[200]. Cuttings of half-ripe wood, 8 - 10 cm with a heel, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth. 20 cm long, November in a sheltered outdoor nursery bed[200].

nwatta An easily grown plant, succeeding in most fertile soils[11, 200]. Prefers a moist well-drained soil in sun or partial shade[200]. Tolerates atmospheric pollution[200]. Plants are very floriferous and can exhaust themselves, literally flowering themselves to death. The flowers are borne in the leaf nodes of the previous years growth and any pruning is therefore best done as soon as the plant has finished flowering[182]. There are some named forms selected for their ornamental value[200]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.632 *Clematis tibetana*

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutil tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Clematis tibetana* is a deciduous Climber growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antipruritic AntitumorThe stem and flowers are used in Tibetan medicine, they are considered to have and acrid and sweet taste with a heating potency[241]. They promote stomach heat and destroy 'cold tumours'[241]. They

are used in the treatment of skin irritations and itches, and tumours[241].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[1]. Succeeds in acid as well as alkaline soils[200]. Plants are hardy to about -15°C[184]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Flowers are produced on the current season's growth, any pruning is best carried out in spring[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.633 *Salix eriocephala*

Missouri Willow, Missouri River willow

5 tlin 9 cyuc 0 kcaak 3 tcan 2 dwat 4 m hkuc htut cyutil tcuphja7n hwicli hyihshasljutnykrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix eriocephala* is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta Basketry Fodder Shelterbelt Soil stabilizationThe stems are tough and very flexible, they are used in basket making[199, 257]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The cultivar 'Green USA' is ideal as a windbreak, it tolerates very poor light soils[199]. The plants extensive root system make it effective at binding the soil along the sides of streams[229]. Wood - more durable that that of most willows, it is used for fence posts[82, 229]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Fodder: Bank Industrial Crop: Biomass Manage Coppice Other Systems: SRC Regional CropSucceeds in most soils, including wet, ill-drained or intermittently flooded

soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. A fast-growing and relatively long lived species[229]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Closely related to *S. mackenziaana* and *S. lutea*[11]. There are some named varieties[199]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.634 Ilex yunnanensis

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta *Ilex yunnanensis* is an evergreen Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta FebrifugeA tea made from the leaves is used as a febrifuge[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years[78].

nwatta Succeeds in most soils so long as they are not water-logged[200]. This species is related to *I. crenata*[11]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

### 6.2.635 Clematis orientalis

Oriental virginibower

5 tlin 9 cyuc 0 kcaak 1 tcan 1 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Clematis orientalis* is a deciduous Climber growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Plants can be used as ground cover[208]. They grow rapidly to give a tangled mass of growth in sun or moderate shade[197].

dwatta Antiseptic RefrigerantThe plant is antiseptic and refrigerant. It is used as a gargle for ulcerated throats and also to treat dog bites[178].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. Plants are hardy to about -15°C[184]. A twining plant[182]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Flowers are produced on the current season's growth, any pruning is best carried out in spring[219]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. The flowers have a delicate perfume similar to cowslips[245].

### 6.2.636 Euonymus fortunei

Winter Creeper, Wintercreeper Euonymus

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 4.5 m hkuc pcmhmimhtut cyutli kyuctcup hwicli hrasjlutnyikfrp hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Euonymus fortunei* is an evergreen Climber growing to 4.5 m (14ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta Hedge HedgeA good evergreen ground cover plant[184, 200]. The sub species *E. fortunei* radicans and *E. fortunei* carrieri are particularly useful, other forms to use include 'Emerald and Gold', 'Emerald Gaiety', 'Coloratus', 'Dart's Carpet' and 'Kewensis'[182, 188, 197]. Plants can be grown as a low hedge[29], the varieties 'Emerald and Gold' and 'Variegatus' are normally used. They are very tolerant of clipping[200].

dwatta Cancer Women's complaintsPlants contain the anticancer compound dicitol[218]. The plant is used in gynaecological applications[218].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[78, 98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Landscape Uses:Container, Erosion control, Ground cover, Massing. Thrives in almost any soil, including chalk, and is particularly suited to dry shaded areas[200]. Grows well in heavy clay soils. Prefers a well-drained loamy soil. Thrives in sunny positions and in deep shade[11, 182], though it does not fruit so well in the shade. Plants are hardy

This oil should not be used internally, except under professional supervision[254].

propta Seed - requires about 3 weeks cold stratification. Germination is best at a temperature around 13 - 16°C[238]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer[200]. Cuttings of softwood in the spring[200, 238].

nwatta Landscape Uses:Alpine garden, Rock garden. Requires a well-drained soil in full sun[200]. Plants are intolerant of excessive wet, especially in the winter, and will do better if covered by a pane of glass in the winter[200]. This species is hardy to at least -5°C, probably more if the ground is very well-drained[200]. Special Features:Not North American native, Extended bloom season in Zones 9A and above.

### 6.2.681 Chrysogonum virginianum

Golden-knee, Green and Gold, or Goldenstar

5 tlin 9 cyuc 0 kcaak 3 tcan 0 dwat 0.2 m hkuc pcmhmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta *Chrysogonum virginianum* is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta  
tcanta *C. virginianum* spreads slowly via stolons to form a groundcover. Wildlife Habitat: A host wildlife such as reptiles, mammals, and songbirds. Insectary: The flowers provide nectar to pollinators. Ornamental Green and Gold is often planted ornamentally for its light green triangular foliage and golden star-shaped flowers. There are a number of named cultivars selected for ornamental properties[318-1].

dwatta None known  
propta Easily grown from seed and may self-seed in the garden.

nwatta A low growing herbaceous perennial with starry golden daisy-like flowers native to the USA. Easily grown in average, medium moisture, well-drained soils in part shade to full shade. Prefers moist, acidic, organically rich soils in sun-dappled part shade. Tolerates full sun only if grown in consistently moist soils. Spreads by rhizomes to form an attractive ground cover, but is easily controlled[368-1]. Growth Rate: Moderate to Fast. Stand Persistence: Long. Form: Spreading. Texture: Medium. Sun: Full Sun, Partial Shade. Soil Type: Sandy, Loamy, Silty, Clay. Soil Moisture: Moderate. Root Type: Stolon, Fibrous Shallow. Bacteria-Fungal Ratio: 10:1-100:1. Seasonal Interest: Spring-Fall. In the US it grows more upright in northern climates and more prostrate in southern climates. Recommended to naturalize in rain gardens. Best in well-drained soils. Blooms sparsely during the heat of summer. Fruit Type: Achene. Flower Color: Yellow. Soil pH preference: 6.0 - 6.8. Drought: Moderate. Flood: Tolerant. Salt: Intolerant. Soil Compaction: Intolerant. Cold Injury: Moderate. Wind Storm Damage: Infrequent. Disease Issues: Minor. Insect/Pest Damage: Minor. Animal Damage: Deer, Rabbits. Growing Season: Bloom Time: Spring - Fall. Fruit Time: Spring - Fall [318-1]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. An evergreen. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2]. Used in the Beach Plum Tree Guild: (Polycultures: Permaculture Activist Magazine February 2013, Eric Toensmeier.) Beach Plum (*Prunus maritima*) This fruiting shrub can grow to over 12 feet (4 meters) and produces small, delicious plums. Niche: deciduous shrub. Habitat: average water needs, Full to partial sun, Preferred soil types UNKNOWN (assume loamy soil is good?). Notable Products: Edible fruit, Green and Gold (*Chrysogonum virginianum*) This is a beautiful groundcover that attracts beneficial insects and can grow in partial shade and moist soils. Niche: Ground cover. Habitat: Requires consistently moist

soil that drain. Full sun to partial shade, Notable Products: Nectar. Dwarf Coreopsis (*Coreopsis auriculata nana*) This is another beautiful groundcover that attracts beneficial insects. Niche: Herbaceous perennial. Habitat: Full sun, medium water needs, said to be native to open woods in South Eastern US, so it probably can survive in a variety of soil types. Notable Products: Nectar, pollen. Ramps (*Allium tricoccum*) a.k.a. Wild Leeks, are early Spring vegetables and grows well in the shade. Niche: Herbaceous perennial. Habitat: Shaded woodlands, average water needs, prefers wet and acid soils. Tolerats juglone. Notable Products: Edible leaves and bulbs. Camas (*Camassia quamash*) has edible bulbs and has flowers that attract beneficial insects. Niche: Small Herbaceous plant. Habitat: Full sun to light shade, prefers moist soil, pH: 5.1-7.5 (tolerates a wide range of soil conditions). Notable Products:Nectar, pollen, edible bulb. Notes: This is a polyculture with flowering plumb and ground cover, edible Spring vegetables, and edible Camas bulbs.

### 6.2.682 Achillea erba

Musk Milfoil

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat m hkuc htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Achillea erba-rotta moschata* is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta None known  
dwatta Appetizer Diaphoretic Digestive Diuretic Stomachic TonicThe leaves and flowering stems are appetizer, diaphoretic, digestive, diuretic, stomachic and tonic[9, 46, 61]. An infusion is used in the treatment of liver and kidney disorders, as a tonic to the digestive system, exhaustion, nervous headaches etc[9]. The plant is harvested in the summer and can be dried for later use[9].

propta Seed - sow spring or early autumn in a cold frame[133]. The seed usually germinates in 1 - 3 months[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Very easy, the divisions can be planted direct into their permanent positions. Basal cuttings of new shoots in spring. Very easy, collect the shoots when they are about 10cm tall, potting them up individually in pots and keeping them in a warm but lightly shaded position. They should root within 3 weeks and will be ready to plant out in the summer.

nwatta Succeeds in most soils but prefers a well-drained soil in a sunny position[1]. Lives longer in a poor soil[200]. Hybridizes freely with other members of this genus[200]. Plants succeed in maritime gardens[233].

### 6.2.683 Veronicastrum sibiricum

Blackroot

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta *Veronicastrum sibiricum* is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta The root is antimicrobial and hepatic[279]. It is used in Korea in the treatment of the common cold and as a liver tonic[279].

late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

### 6.2.677 Verbascum blattaria

Moth Mullein

5 tlin 9 cyuc 0 ckac 2 tcan 0 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Verbascum blattaria is a BIENNIAL/PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta RepellentThe plant repels insects, it is used indoors to repel moths and cockroaches[124]. Dynamic accumulator.

dwatta None known

propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta An easily grown plant, it succeeds in most well-drained soils, including dry ones, and prefers a sunny position[187, 200]. Dislikes shade[200]. Plants are hardy to about -20°c[187]. Hybridizes with other members of this genus, though the progeny are usually sterile[200].

### 6.2.678 Hypericum androsaemum

Tutsan, Sweet-amber, St. Johnswort

5 tlin 10 cyuc 0 ckac 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli hgatykyuctcup hwicli hrasjlutnyik hpa7tli frusflatpriklwisslip hpa7tmwatli fyifxre7t hjonli

drutta Hypericum androsaemum is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta None known

tcanta A good ground cover plant[208]. Although it is clump forming rather than spreading it increases freely by self-sowing[186, 200]. Plants are best spaced about 90cm apart each way[208].

dwatta Antiseptic Diuretic Stomachic VulneraryThe leaves are diuretic, stomachic and vulnerary[61, 186]. They have antiseptic properties and have been used to cover open wounds[245].

propta Seed - sow spring in a greenhouse and only just cover the seed. The seed usually germinates in 1 - 3 months at 10°c. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 12 cm with a heel, July/August in a frame. Plant out in the following spring[200] Careful division of old suckering shrubs in the dormant season.

nwatta Landscape Uses:Border, Erosion control, Ground cover, Massing, Rock garden. Easily grown in any reasonably good well-drained but moisture retentive soil[1]. Tolerates a wide range of pH[186]. Succeeds in sun or semi-shade[1] but flowers better in a sunny position[200]. Succeeds in dry shade and is drought tolerant when established[190]. Hardy to about -20°c, but if cut back by cold weather plants can re-sprout from the base[184]. Plants often self-sow freely[208]. A number of named forms have been developed for their ornamental value[182]. Plants in this genus are notably resistant to honey fungus[200]. The leaves are covered in pellucid dots which, when touched, release a resinous smell somewhat like goats[245]. Special Features: Attractive foliage, Naturalizing, Attracts butterflies, Attractive flowers or blooms

### 6.2.679 Primula macrophylla

5 tlin 9 cyuc 0 ckac 0 tcan 2 dwat m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Primula macrophylla is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antiinflammatory FebrifugeThe entire plant is used in Tibetan medicine, it is said to have a bitter taste and a cooling potency[241]. Antidiarrhetic, anti-inflammatory and febrifuge, it is used in the treatment of diarrhoea, inflammation of the liver, gall bladder, stomach and intestines[241]. It is especially used for children with high fever and diarrhoea[241].

propta Seed - best sown as soon as it is ripe in a cold frame[133]. Sow stored seed in early spring in a cold frame[1]. Germination is inhibited by temperatures above 20°c[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in autumn. This is best done every other year[200].

nwatta A plant of high alpine areas, it is of difficult cultivation in Britain[200]. In the wild it experiences wet summers, relatively dry autumns and long winters under a blanket of snow that protects the bulb-like resting bud[200]. It is best to give the plants a deep, well-drained soil in a sunny position with the added protection of a pane of glass[200].

### 6.2.680 Anacyclus pyrethrum

Mount Atlas Daisy, Chamomile Spanish, Pellitory

5 tlin 7 cyuc 0 ckac 0 tcan 2 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Anacyclus pyrethrum is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Acrid Antirheumatic Epilepsy OdontalgicThe root is a pungent acrid herb that stimulates the salivary glands and irritates the tissues, thereby increasing blood flow to the area[238]. It is used externally to treat toothache, facial neuralgia and chronic catarrh[238]. A gargle is used to soothe sore throats[254]. The root is harvested in the autumn and dried for later use[238]. In Ayurvedic medicine the root is considered to be tonic and is used in the treatment of paralysis and epilepsy[254]. The diluted essential oil in the root is used in mouthwashes and to treat toothaches[254].

to about -18°c[202]. A shrubby somewhat creeping plant that can also climb by means of aerial roots[184], if placed by a support, a wall, tree or fence, the plant will start to climb it and will be self-attaching to a large degree[182, 219]. Plants do not normally require pruning[219]. Plants have two forms of growth, a juvenile form and a mature form when the plants come into flower[219]. Plants in Britain often retain the juvenile form and never flower[219]. A polymorphic species[58], there are a number of named varieties selected for their ornamental value[182, 202]. Special Features:Not North American native, Invasive, Inconspicuous flowers or blooms.

### 6.2.637 Abelia triflora

Indian Abelia

5 tlin 9 cyuc 0 ckac 1 tcan 0 dwat 3.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli priklwisslip hpa7tmwatli xre7t hjonli

drutta Abelia triflora is a deciduous Shrub growing to 3.5 m (11ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known
tcanta Wood - hard, close and even-grained. Used for walking sticks[146, 158].

dwatta None known

propta Seed - we have no specific information for this plant, but suggest sowing the seed in early spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a slight heel, July in pots of sandy soil in a frame[11]. Takes 3 - 4 weeks. Very easy, a good percentage of the cuttings root[78]. Cuttings of mature wood, 7 - 10cm with a heel if possible, November in a cold frame. High percentage[78]. Layering young shoots[245].

nwatta Requires a well-drained open loamy soil[11] in a warm, sheltered sunny position[200, 245]. Plants are best grown in semi-shade[219]. They are intolerant of water-logging[200] and of dry soils[219]. Succeeds in any soil but new growth is less vigorous in dry soils[202]. One report says that the plant likes a soil with a high chalk content[245], though another says that chlorosis occurs on very alkaline soils[202]. This species is hardy to about -15°c[184], it grows well in the open at Kew[11]. A fairly slow-growing plant, it is shy to flower in British gardens unless placed against a sunny wall[219]. It flowers on wood that is 2 - 3 years old or older[182]. Another report says that the plant flowers on the new wood[219], whilst another says that it flowers on terminal clusters[245]. Any pruning is best done immediately after flowering by thinning out the old wood[182, 219]. Plants in this genus are notably resistant to honey fungus[200], closely related to A buddleioides and A. umbelata[182]. The flowers are wonderfully scented[182], with the fragrance of vanilla[245].

### 6.2.638 Forsythia x intermedia

Golden Bell, Border Forsythia

5 tlin 8 cyuc 0 ckac 3 tcan 0 dwat 2.5 m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Forsythia x intermedia is a deciduous Shrub growing to 2.5 m (8ft) by 2.5 m (8ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Hedge HedgeCan be grown as a tall hedge, the var. 'Lynwood' is frequently used[29]. Var. 'Spectabilis' also makes a good hedge[200] as does 'Beatrix Farrand'[188]. Landscape Uses: Border, Erosion control, Espalier, Pest tolerant, Hedge, Massing, Screen, Specimen.

dwatta None known

propta Seed - sow spring in a cold frame. The seed usually germinates within 2 months[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This is a hybrid species and seed will not come true to type. Cuttings of half-ripe wood 10 - 15cm taken at a node, July/August in a frame. Plant out in autumn or spring. A very high percentage, they root within 3 weeks[78]. Cuttings of mature wood in a sheltered outdoor bed. Good percentage[78].

nwatta An easily grown plant, it succeeds in a well drained ordinary garden soil but prefers a rich soil[1]. Succeeds in limy soils[11]. Prefers a sunny position but succeeds in semi shade[200]. Plants are tolerant of deep shade[219]. A very ornamental plant[1], there are several named varieties. Any pruning out of weak shoots, plus any trimming of hedges, is best done after the plant has flowered[188]. Birds may destroy the flower buds in cold areas[200]. This species is notably susceptible to honey fungus[200]. Special Features:Not North American native, Blooms are very showy. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

#### 6.2.639 Forsythia viridissima

Golden Bells, Greenstem forsythia, Forsythia
5 tlin 8 cyuc 0 ckac 3 tcan 2 dwat 2.5 m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatpriklwisslip hpa7tmwatli dytxre7t hjonli

drutta Forsythia viridissima is a deciduous Shrub growing to 2.5 m (8ft 2in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from August to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Landscape Uses: Border, Erosion control, Ground cover, Massing.

dwatta Antibacterial Antifungal Antispasmodic EmmenagogueThe fruit is antibacterial, antifungal, antispasmdic and emmenagogue[279]. It is used in Korea to treat carbuncles, mastitis, inflammation, suppuration, lymphadenitis and suppressed menstruation[279].

propta Seed - sow spring in a cold frame. The seed usually germinates within 2 months[K]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 15cm taken at a node, July/August in a frame. Plant out in autumn or spring. A very high percentage, they root within 3 weeks[78]. Cuttings of mature wood in a sheltered outdoor bed. Good percentage[78]. Layering in spring or summer. Plants often self-layer[K].

nwatta An easily grown plant, it succeeds in all soil types[202] but prefers a rich soil. Succeeds in limey soils. Grows well in heavy clay soils. It prefers a sunny position but succeeds in semi shade though it is apt to get leggy if grown in the shade of trees[182]. Succeeds against a north-facing wall[219]. Plants are hardy to about -25°c[184]. Plants are medium to fast growing[202]. Flowers are produced on wood that is more than one year old[202]. Any pruning is best done immediately after the plant has finished flowering[182,

200]. There are some named varieties, selected for their ornamental value[11, 200]. This species is notably susceptible to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Blooms are very showy. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 6.2.640 Euonymus americanus

Strawberry Bush, Bursting-heart
5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 2.5 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Euonymus americanus is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known
tcanta None known
dwatta Cathartic Diuretic Emmenagogue Expectorant Laxative Malaria TonicThe seed is strongly laxative[222]. A tea made from the roots is used in cases of uterine prolapse, vomiting of blood, painful urination and stomach aches[222, 257]. The bark is diuretic, expectorant, laxative and tonic[222]. It was used as a tea in the treatment of malaria, liver congestion, constipation etc[222, 257]. The powdered bark, applied to the scalp, was believed to eliminate dandruff[222]. An infusion of the plant has been used to stimulate menstruation and so should not be used by pregnant women[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame[78, 98]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm long taken at a node or with a heel, July/August in a frame. Very easy[200].

nwatta Thrives in almost any soil, including chalk, it is particularly suited to dry shaded areas[200]. Prefers a well-drained loamy soil[1]. Requires shade from the midday sun[1, 11].

## 6.2.641 Asclepias subulata

Rush Milkweed
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli kyuctcup hwicli hyishras hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Asclepias subulata is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known
tcanta LatexRubber can be made from latex contained in the leaves and the stems[61, 112, 171]. The dogbane-milkweed family Asclepias, Apocynum, Calotropis, and Trachomitum spp) has been used for fiber industrial crops for millennia with a number in cultivation as regional crops. All of these crops are dual-purpose fibres, offering bast fibres from the stem and seed finer or 'floss' in the fruit pods. Many have also been identified as potential hydrocarbon crops due to high latex content. Could be integrated into various agro-forestry systems rather than as monocultures [1-1].

dwatta Emetic Ophthalmic Purgative StomachicThe plant is emetic, ophthalmic, purgative and stomachic[61, 257]. The reports do not specify which part of the plant is used.

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn or in late winter[134, 169]. We have also had good results from sowing the seed in the greenhouse in early spring[K], though stored seed might need 2 - 3 weeks cold stratification[134]. Germination usually takes place in 1 - 3 months at 18°c[134]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant out when they are in active growth in late spring or early summer and give them some protection from slugs until they are growing away strongly. Division in spring. With great care since the plant resents root disturbance. Pot the divisions up and place them in a lightly shaded position in the greenhouse until they are growing away strongly, then plant them out in the summer, giving them some protection from slugs until they are established.. Basal cuttings in late spring. Use shoots about 10cm long with as much of their white underground stem as possible. Pot them up individually and place them in a lightly shaded position in a greenhouse until they are rooting and growing actively. If the plants grow sufficiently, they can be put into their permanent positions in the summer, otherwise keep them in the greenhouse until the following spring and when they are in active growth plant them out into their permanent positions. Give them some protection from slugs until they are established.

nwatta Experimental Crop Industrial Crop: Hydrocarbon Management: HayPrefers a well-drained light rich or peaty soil in a sunny position[1, 200]. Succeeds in poor soils. Many members of this genus seem to be particularly prone to damage by slugs. The young growth in spring is especially vulnerable, but older growth is also attacked and even well-established plants have been destroyed in wet years[K]. Plants resent root disturbance and are best planted into their final positions whilst small[134]. A xerophytic plant, it looks like a species of Ephedra[200]. The flower of many members of this genus can trap insects between its anther cells, the struggles of the insect in escaping ensure the pollination of the plant[207].

## 6.2.642 Ageratina herbacea

Fragrant Snakeroot
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Ageratina herbacea is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known
dwatta A cold infusion of the plant is drunk and also used as a lotion in the treatment of headaches and fevers[257].

propta Seed - sow spring in a cold frame, only just covering the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Succeeds in an ordinary well-drained but moisture retentive garden soil in sun or part shade[200].

## 6.2.643 Myricaria germanica

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 2 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Myricaria germanica is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid,

resents root disturbance[200]. Root cuttings in autumn or winter[200].

nwatta Requires a well-drained soil and a sunny position[1]. Prefers a light sandy soil but tolerates most soil types including lime and poor gravels[200]. Plants should be put in their final position whilst small since they resent root disturbance[200]. Plants labelled in nurseries as *E. aquaticum* are often *E. yuccifolium*[200].

## 6.2.673 Xanthorhiza simplicissima

Yellowroot
5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc pcmhminhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Xanthorhiza simplicissima is a deciduous Shrub growing to 1 m (3ft 3in) by 3 m (9ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from March to April. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known
tcanta DyeA yellow dye is obtained from the root[46, 61]. The entire plant can be crushed to yield a yellow dye[257]. A good ground cover for damp semi-shaded positions[11, 200]. Plants should be spaced about 1.2 metres apart each way[208].

dwatta Antihæmorrhoidal Astringent Stomachic TonicThe root is astringent and a blood tonic[222]. A tea made from the roots is used to treat mouth ulcers[213], stomach ulcers, colds, jaundice etc[222, 257]. An infusion of the roots has also been used to treat piles, though the report does not specify if it is used internally or externally[257]. Some caution is advised in the use of this plant, see the notes above on toxicity. The root contains the alkaloid 'berberine' which is used for its tonic properties and for digestive disorders[213]. Berberine is anti-inflammatory, astringent, haemostatic, antispasmodic, immuno-stimulant, uterine tonic and antimicrobial[222]. It stimulates the secretion of bile and bilirubin and may be helpful in correcting high tyramine levels in people with liver cirrhosis[222].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn[200]. Sow stored seed in a cold frame in late winter. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in the autumn or late winter[11].

nwatta Requires a moist acid soil in sun or part shade[184]. Prefers shade or semi-shade[188]. Succeeds in any moist fertile soil according to other reports[1, 182, 200]. Hardy to about -20°c[184]. Plants can spread considerably by means of suckers[182], especially when they are growing in a light soil[208]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 6.2.674 Solidago gigantea

Giant Goldenrod
5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Solidago gigantea is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta BasketryThe stems can be made into rough baskets[257].

dwatta Astringent Cathartic Diuretic Febrifuge StypticThe leaves and blossoms are astringent, cathartic and styptic[4]. They are a valuable remedy in the treatment of all

kinds of hæmorrhages[4]. An infusion of the blossoms has been used to treat various fevers[257]. An oil obtained from the plant (is this an essential oil?) is diuretic[4].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. This species has become a weed in its native range, increasing freely by seed and at the root[200]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238].

## 6.2.675 Lithospermum caroliniense

Hairy Puccoon, Carolina puccoon
5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Lithospermum caroliniense is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known
tcanta DyeA red dye is obtained from the dried or pulverized root[61, 257].

dwatta VulneryThe powdered root has been used in the treatment of chest wounds[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings. Division.

nwatta Requires a warm sunny position in a moderately fertile well-drained lime-free sandy soil[1, 200].

## 6.2.676 Aconitum orientale

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aconitum orientale is a PERENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known
dwatta Anodyne Diaphoretic DiureticThe dried root is anodyne, diaphoretic and diuretic[4]. It should be harvested in the autumn as soon as the plant dies down[4]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or



and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta A yellow dye is obtained from the stems[257]. Onion skins are sometimes added when making the dye[257]. Sometimes grown as an ornamental plant (but can be weedy).

dwatta Astringent SalveA decoction of the roots is used in the treatment of backaches[222]. A tea made from the leaves is used in the treatment of diarrhoea[222]. Externally, it is used as a wash for frostbite, sores, itching, piles and poison ivy rash[222, 257].

propta Seed - surface sow in early spring in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on for the first winter in a cold greenhouse. Plant out in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Requires a light porous sandy soil in full sun[200]. Plants are often found in very acid soils in the wild[236]. This plant was inadvertently introduced to the Hawaii Islands in 1932 and has spread widely there. It is considered to be one of the most threatening of exotic species, invading native habitats and altering the fire and hydrology regimes[274].

### 6.2.670 Verbascum phlomoides

Woolly Mullein, Orange mullein

5 tlin 9 cyuc 0 kcak 2 tcan 3 dwat 1.2 m hkuc

htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Verbascum phlomoides is a BIENNIAL/PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta RepellentThe whole plant is used to repel mice and rats[46, 61]. Dynamic accumulator.

dwatta Anodyne Antiseptic Demulcent Diuretic Expecto- rant Pectoral VermifugeThe seed is used to expel tape- worms from the body[4]. No other details are given, but the seeds probably contain saponins and so should be used with caution[K]. The flowers and leaves are anodyne, anti- septic, astringent, demulcent, emollient, expecto- rant, pectoral and vulnerary[21, 238]. An infusion is used internally in the treatment of various respiratory complaints including coughs, bronchitis, asthma and throat irritations[238]. An infusion of the fresh or dried flowers in olive oil is used to treat earaches, sores, wounds, boils etc[238]. The plant is harvested when in flower and should be dried quickly and with care or it will lose its medicinal qualities[238].

propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta An easily grown plant, it succeeds in most well- drained soils, including dry ones, and prefers a sunny position[200]. Dislikes shade and wet soils[200]. Thrives on chalk[200]. Prefers a light soil[200]. This species is hardy to at least -15°C[200]. Hybridizes with other members of this genus, though the progeny are usually sterile[200]. Plants can perennate when growing in light well-drained soils[111].

### 6.2.671 Hypericum hypericoides

St. Andrews Cross

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1.2 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Hypericum hypericoides is a deciduous Shrub growing to 1.2 m (4ft). See above for USDA hardiness. It

is hardy to UK zone 6. It is in flower from July to Septem- ber. The species is hermaphrodite (has both male and fe- male organs) and is pollinated by Insects. The plant is self- fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neu- tral and basic (mildly alkaline) soils. It can grow in semi- shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antidote Kidney LithontripicLithontripic[61]. The root was chewed as an antidote to rattlesnake bites[207, 222]. A tea made from the roots is used in the treatment of colic, fevers, pain, diarrhoea etc[222]. It is applied externally to ulcerated breasts[222]. A tea made from the leaves is used in the treatment of kidney and bladder ailments, skin prob- lems and children's diarrhoea[61, 222]. A milky substance obtained from the plant has been rubbed on sores[257].

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, af- ter the last expected frosts. Cuttings of half-ripe wood 10 - 12 cm with a heel, July/August in a frame. Plant out in the following spring[200]. Cuttings of mature wood, 12 - 17cm with a heel, October/November in a sheltered position out- doors. Plants root by the spring. Good percentage[78]. Di- vision in spring as new growth commences[78]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any reasonably good well- drained but moisture retentive soil[1]. Succeeds in sun or semi-shade but flowers better in a sunny position[1]. Prefers a light loamy soil[11]. One report says that the plant requires frame protection in the winter[1] whilst another says that plants are hardy but short-lived at Kew[11]. It possibly suf- fers more from wet soils than from the cold, see the plant's native habitat above. Plants in this genus are notably resis- tant to honey fungus[200].

### 6.2.672 Eryngium aquaticum

Button Snakeroot, Rattlesnakemaster

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1.2 m hkuc

htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Eryngium aquaticum is an evergreen Perennial growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutri- tionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta None known

dwatta Antidote Diaphoretic Diuretic Emetic Expecto- rant HomeopathyThe plant is diaphoretic, diuretic, expecto- rant and in large doses emetic[207]. It is used mainly in the treatment of disorders of the kidneys and sexual organs[238, 257]. It has been used as an antidote to snake poison[207, 257]. The pounded roots are used as a diuretic[213]. An in- fusion of them is used to reduce fevers[213]. The plant is used as an antidote to snakebites. The roots are chewed and ap- plied to the bite[213]. A homeopathic remedy is made from the fresh or dried root[4].

propta Seed - best sown as soon as it is ripe in early autumn on the surface of a well-drained compost in a cold frame[200]. The seed can also be sown in spring. It usu- ally germinates in 5 - 90 days at 20°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first win- ter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Di- vision in early spring or autumn. Take care since the plant

neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta FuelThe wood is used as a fuel[146].

dwatta AperientA decoction of the bark is aperient[240]. It is used in Spain in the treatment of jaundice[240].

propta Seed - sow early spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half- ripe wood, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth, November to January in a sandy propagating mix in an open frame[11, 200].

nwatta Prefers a fertile well-drained soil in full sun with shelter from cold drying winds[200]. Tolerates chalk soils[200]. An easily grown plant, preferring a damp sandy soil[182]. Closely related and very similar to Tamarisk spp[182].

### 6.2.644 Ageratina altissima

White Snakeroot, Richweed

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Ageratina altissima is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Diaphoretic Diuretic Febrifuge Odontalgic Stim- ulant Tonic UrinaryThe root is diaphoretic, diuretic, febrifuge, stimulant and tonic[257]. It has been used in the treatment of diarrhoea, gravel and urinary diseases[257]. It has also been used in herbal sweat baths to encourage sweating[257]. A decoction or infusion of the root has been taken to treat a fallen or inflamed womb[257]. The root has been chewed and held in the mouth as a treatment for toothache[257].

propta Seed - sow spring in a cold frame, only just covering the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring.

nwatta Succeeds in an ordinary well-drained but mois- ture retentive garden soil in sun or part shade[200]. There is some difference of opinion over the correct name for this species with some authorities using Eupatorium rugosum[K].

### 6.2.645 Knautia arvensis

Field Scabious, Field scabiosa

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Knautia arvensis is a PERENNIAL growing to 1 m (3ft 3in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The species is hermaphrodite (has both male and female or- gans) and is pollinated by Bees, Lepidoptera (Moths and But- terflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Antipruritic Astringent Diuretic Eczema Homeo- pathyThe whole plant is astringent and mildly diuretic[9]. An infusion is used internally as a blood purifier and ex- ternally for treating cuts, burns and bruises[9]. The fresh

or dried flowering plant can be used, with or without the roots[9]. A homeopathic remedy is made from the plant[9]. It is used as a blood purifier and as a treatment for eczema and other skin disorders[9].

propta Seed - sow spring or autumn in a cold frame.

When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have enough seed it would be worthwhile trying a sowing in situ outdoors in the spring. The seed germinates in the spring in the wild. Division in the spring. Basal cuttings in late spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any well-drained soil[187]. Prefers a dry soil[9, 17]. Grows well on chalky soils[4]. Prefers a sunny position[188]. A very cold-hardy plant, tolerating tempera- tures down to at least -25°C[187]. Grows well in the summer meadow[24, 187]. The plant is an important source of nectar and pollen for bees and lepidoptera[24, 108]. The plants are sometimes dioecious, if this is the case then male and female plants will need to be grown if seed is required.

### 6.2.646 Leucothoe grayana

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.2 m hkuc

hmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Leucothoe grayana is an evergreen Shrub grow- ing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female or- gans). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta ParasiticideA parasiticide is obtained from the plant (No details are given as to which part). It is also used in the treatment of itch and ringworm[178].

dwatta Antipruritic ParasiticideAntipruritic[178].

propta Seed - sow late winter in a shady part of the greenhouse and only just cover the seed. Do not allow the compost to dry out. Germination is variable. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their perma- nent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 10cm with a heel, August in a frame. Fair to good percentage[78]. Layer- ing in autumn. Takes 12 months. Very high percentage[78].

nwatta Requires a lime-free well-drained humus-rich soil and some shade[1, 182]. Requires a moist peaty soil or a sandy loam with added leafmold[11]. Plants are tolerant of transplanting, which is best carried out in the autumn[200]. The flowers are produced on the current years growth[182]. A number of named forms have been developed in Japan for their ornamental value[182]. Plants in this genus are notably resistant to honey fungus[200].

### 6.2.647 Peucedanum cervaria

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.5 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Peucedanum cervaria is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Diuretic Emmenagogue Febrifuge StomachicDi- uretic, emmenagogue, febrifuge, stomachic[61].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe

if this is possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta An easily grown plant, it succeeds in any moisture-retentive soil in a sunny position[200]. Suitable for group plantings in the wild garden[200]. This species was formerly cultivated as a medicinal plant[61].

## 6.2.648 *Aconitum uncinatum*

Wild Monkshood, Southern blue monkshood

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprikliw hpa7tmwatli hjonli

drutta *Aconitum uncinatum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Alterative Anaesthetic Antiarthritic Deobstruent Diaphoretic Diuretic Sedative StimulantThe dried root is alterative, anaesthetic, antiarthritic, deobstruent, diaphoretic, diuretic, sedative, stimulant[178]. It is harvested as soon as the plant dies down in the autumn. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner. A tincture is used as an external anaesthetic[207].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Members of this genus seem to be immune to the predations of rabbits and deer[233]. Grows well in open woodlands[1, 4]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

## 6.2.649 *Verbascum lychnitis*

White Mullein

5 tlin 9 cyuc 0 kcak 2 tcan 0 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Verbascum lychnitis* is a BIENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta RepellentFlower heads are used as a mouse and rat repellent in fruit stores etc[46, 61]. Dynamic accumulator.

dwatta None known  
propta Seed - sow late spring to early summer in a cold frame and only just cover the seed[200]. Germination usually takes place within 2 - 3 weeks. When they are large enough to handle, prick out the seedlings into individual pots and plant them out in late summer. The seed has a long viability[200].

nwatta An easily grown plant, it succeeds in most well-drained soils, including dry ones, preferring a sunny position[200]. Dislikes shade and wet soils[200]. Thrives on

chalk[200]. Prefers a light soil[200]. Hybridizes with other members of this genus, though the progeny are usually sterile[200].

## 6.2.650 *Reseda luteola*

Weld, Dyer's Rocket

5 tlin 9 cyuc 0 kcak 3 tcan 1 dwat 1.5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Reseda luteola* is a BIENNIAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: OilNone known  
tcanta Dye OilA deep yellow dye is obtained from the plant, it is of very good quality[17, 46, 74]. The plant is harvested as the last flowers fade[115]. Most of the dye is found in the seed[115]. An oil is obtained from the seed, used in lighting[100].

dwatta NarcoticNarcotic (mild).  
propta Seed - sow in situ in the spring and only just cover the seed. An autumn sowing usually succeeds in areas where winter temperatures do not fall below about -10°C[200]. The seed germinates in the autumn in the wild.

nwatta Easily grown in any well-drained neutral to slightly alkaline soil in a sunny position or in some shade if the summers are long and hot[200]. At one time this plant was commonly cultivated for the dye obtained from the leaves and seed but with the advent of chemical dyes it has fallen into disuse[1, 17, 46]. A good plant for bees and butterflies[200]. Plants dislike root disturbance, they can be transplanted but care must be taken not to break the tap root[169].

## 6.2.651 *Geranium pratense*

Meadow Crane's Bill, Meadow geranium, Geranium

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Geranium pratense* is a PERENNIAL growing to 1.2 m (4ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta Analgesic Antiinflammatory Febrifuge VulneraryThe plant is used as a vulnerary[240]. The root is used in Tibetan medicine where it is said to have an acrid, sweet flavour plus a cooling potency[241]. Analgesic, anti-inflammatory and febrifuge, it is used in the treatment of fevers from influenza, inflammation of the lungs, pain and swellings of the limbs[241].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Alpine garden, Border. Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. There are many named varieties, selected for their ornamental value[200]. Plants can be naturalized in meadows[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Special Features: Attractive foliage, Not North American native, Naturalizing, Suitable for cut flowers.

htut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Hebe 'Great Orme' is an evergreen Shrub growing to 1.5 m (5ft) by 1.2 m (4ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Hedge HedgeCan be used as a hedge in maritime areas, it is very resistant to salt winds[200]. Attractive flowers.

dwatta None known  
propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse in spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This species is a hybrid and will not breed true from seed. Cuttings of half ripe wood, 3 - 5cm with a heel, July/August in a frame. Cuttings of mature wood, late autumn or winter in a frame.

nwatta Prefers a position in full sun, succeeding in most well-drained soils with some shelter from cold winds[200]. Dislikes very dry soils and water-logged soils, but is somewhat drought tolerant when established[190]. Tolerant of atmospheric pollution and maritime exposure[200]. Plants are hardy to about -10°C. They grow well in a dry border in an Essex garden[190]. Hybridizes freely with other members of this genus[200]. Tolerant of pruning, plants can be cut back into old wood if required[188]. Closely related to *H. 'Carnea'* [200]. This species is very easy to transplant and, with care, it can even be moved when in flower. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a 'clumping' habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 6.2.667 *Rubia tinctorum*

Madder, Dyer's madder

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Rubia tinctorum* is an evergreen Perennial growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta Dye PolishA very good quality red dye is obtained from the roots. Some reports say that 2 year old roots are used in the spring and autumn[61, 200, 238] whilst others say that 3 year old roots are used[169, 171]. The roots can be dried for later use[169]. The dye can also be extracted from the leaves[169]. This dye is also used medicinally[200]. The leaves and stem are prickly, the whorls of leaves having spines along the midrib on the underside[4]. This feature enables them to be used for polishing metalwork[4, 148].

dwatta Aperient Astringent Cholagogue Diuretic EmmenagogueThe root is aperient, astringent, cholagogue, diuretic and emmenagogue[4, 7, 21]. It is taken internally in the treatment of kidney and bladder stones[238]. The root is seldom used in herbal medicine but is said to be effective in the treatment of amenorrhoea, dropsy and jaundice[4]. The roots are harvested in the autumn from plants that are at

least 3 years old. They are peeled and then dried[238]. When taken internally the root imparts a red colour to the milk, urine and bones, especially the bones of young animals, and it is used in osteopathic investigations[4, 200].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed can be very slow to germinate[200]. Prick out the seedlings when they are large enough to handle and grow them on in light shade in the greenhouse for the first year. Plant them out into their permanent positions in early summer. Division in spring or at any time in the growing season if the divisions are kept well watered until established[200]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Prefers a light sandy soil in full sun[14]. Plants grown in fertile well-limed soils produce more pigment in the root[169]. This plant was at one time widely cultivated for the red dye obtained from its roots, this dye is now manufactured chemically[200]. However, it is still cultivated in Europe as a medicinal dye plant. The plant produces many side roots that can travel just under the surface of the soil for some distance before sending up new shoots[4]. This species is closely related to *R. peregrina*[4].

## 6.2.668 *Inula conyza*

Ploughman's Spikenard

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.2 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Inula conyza* is a BIENNIAL/PERENNIAL growing to 1.2 m (4ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Insecticide ParasiticideThe leaves are burnt and used as an insecticide and parasiticide, especially against fleas[4, 100]. Even the smell of the plant is said to drive fleas away[4]. The root used to be burnt upon a fire in order to scent a room[245].

dwatta Antiscrofulatic Emmenagogue Parasiticide VulneraryThe herb is antiscrofulatic, emmenagogue and vulnerary[4]. The plant was considered to be a good wound herb and it was frequently taken in decoction for bruises, ruptures, internal wounds etc[4]. It was applied externally to treat itchy skin[4].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it is worthwhile trying a sowing in situ in the spring or the autumn.

nwatta Succeeds in an ordinary garden soil in a sunny position[1]. The basal leaves of this species are often mistaken for the foxglove, *Digitalis purpurea*[17]. The basal leaves form a rosette that covers the ground for 30cm or more, destroying the grass underneath[245]. All parts of the plant are refreshingly aromatic[245].

## 6.2.669 *Andropogon virginicus*

Broomsedge Bluestem

5 tlin 9 cyuc 0 kcak 1 tcan 1 dwat 1.2 m hkuc htut cyutli kyuctcup hwicli hras hpa7tli frusflatprikliw hpa7tmwatli xre7t hjonli

drutta *Andropogon virginicus* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) soils

(loamy) soils. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta WoodWood - heavy, hard, close-grained, not strong[82].

dwatta Astringent StypticThe spongy bark at the base of the trunk is pliable, absorbent and astringent. It has been recommended as a styptic[82].

propta Seed - best sown as soon as it is ripe in a greenhouse[200]. As soon as they are large enough to handle, prick out the seedlings into individual pots. Grow them on in the greenhouse for at least their first winter, planting them out in early summer when there is no danger of frost. Give them some protection from the cold for their first winter outdoors. Cuttings of softwood, spring in a frame[200]. Cuttings of half-ripe wood, July/August in a frame[200]. Root cuttings in the spring[200].

nwatta Landscape Uses:Hedge, Standard, Woodland garden. Requires a sunny position and a humus-rich soil[200]. Thrives in a mixture of peat and loam[11]. Prefers a circum-neutral or slightly acid, moisture-retentive soil[200]. This species has a wide distribution in the wild, extending southwards from South-eastern North America to Brazil. An evergreen small tree in the warmer parts of its range, only those forms from the most northerly part of its range can be grown outdoors in Britain. These northerly forms are deciduous, though may remain evergreen in mild winters[11, 200]. They usually take the form of a small shrub, but can sometimes become a small tree. They succeed outdoors in the south of Britain, though can be damaged or killed in severe winters[11]. The flowers are produced at the base of the current years growth[11, 200]. Special Features:Attractive foliage, North American native, Naturalizing, Wetlands plant, Fragrant flowers, Attractive flowers or blooms

## 6.2.663 Aconitum kusnezoffii

Bei Wu Tou

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.5 m hkcw hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Aconitum kusnezoffii is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Alterative Anaesthetic Antiarthritic Deobstruent Diaphoretic Diuretic Sedative StimulantThe root is alterative, anaesthetic, antiarthritic, deobstruent, diaphoretic, diuretic, sedative and stimulant[178]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[11]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. This species is closely related to *A. yezoense*[1]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

## 6.2.664 Plumbago europaea

Plumbago

5 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1 m hkcw htut cyutli kyuctcup hwicli hras hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Plumbago europaea is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Acrid Emetic Odontalgic Sialagogue VesicantThe whole plant, but especially the root, is acrid, emetic, odontalgic, sialagogue and vesicant[4, 61, 100, 103]. Chewing the root produces copious salivation and is said to be of benefit in treating toothache[4].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of basal shoots as new growth emerges in the spring. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Requires a well-drained sandy or gritty soil in full sun[200]. One report says that the plant is not very hardy in Britain and is usually grown in a greenhouse[4].

## 6.2.665 Scrophularia ningpoensis

5 tlin 9 cyuc 0 kcak 0 tcan 3 dwat 1 m hkcw hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Scrophularia ningpoensis is a PERENNIAL growing to 1 m (3ft 3in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from June to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antibacterial Antifungal Antiphlogistic Antipyretic Cardiac Diuretic Febrifuge Haemolytic Hypoglycaemic Restorative Sialagogue Tonic VasodilatorThis species has been used in Chinese herbal medicine for over 2,000 years[238]. The root is antibacterial, antifungal, antipyretic, antiphlogistic, cardiac, diuretic, febrifuge, haemolytic, hypoglycaemic, restorative, sialagogue, tonic and vasodilator[147, 176, 218]. Small doses act as a heart tonic, whilst large doses depress cardiac function[176, 238]. The root is used internally in the treatment of feverish illnesses with symptoms such as rashes, delirium and insomnia, dry cough, throat infections, abscesses and carbuncles[238]. The root is harvested in the autumn and dried for later use[238].

propta Seed - sow spring or autumn in a cold frame[238].

When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most moist to wet soils in full sun or partial shade[200, 238]. This species is hardy to at least -15°c[238].

## 6.2.666 Hebe 'Great Orme'

Great Orme Hebe

5 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 1.5 m hkcw

## 6.2.652 Leucothoe axillaris

Coastal Doghobble

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.8 m hkcw hmim cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Leucothoe axillaris is an evergreen Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta None known

dwatta Antipruritic Expectorant PoulticePromotes the discharge of mucus from the nose[61]. An infusion of the leaf is taken internally and also used as a wash in the treatment of rheumatism[257]. A infusion of the leaves and stems has been used to bathe itchy skin[257].

propta Seed - sow late winter in a shady part of the greenhouse and only just cover the seed. Do not allow the compost to dry out. Germination is variable. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 10cm with a heel, August in a frame. Fair to good percentage[78]. Layering in autumn. Takes 12 months. Very high percentage[78].

nwatta Requires a lime-free well-drained humus-rich soil and some shade[11, 182, 200]. Plants are not very successful in Britain[11]. One report says they are not very hardy in Britain, succeeding outdoors only in the milder areas of the country, whilst another says that they are hardy to zone 6, which means tolerating temperatures down to -15° or lower[200]. The flowers are strongly fragrant[245]. This species is often confused with *L. fontanesiana*[182]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.653 Hebe rakaiensis

5 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 1 m hkcw htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Hebe rakaiensis is an evergreen Shrub growing to 1 m (3ft 3in) by 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Hedge HedgeAn excellent ground cover plant[182], though it takes about 2 years to form an effective cover[197]. Plants should be spaced about 60cm apart each way[208]. It can also be grown as a dwarf hedge, tolerating gentle clipping[182]. Attractive flowers.

dwatta None known

propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse in spring. Only just cover the seed and do not allow the compost to dry out. Prick out the seedlings into individual pots when they are large enough to handle. Grow on the young plants for at least their first winter in a greenhouse and plant out in late spring or early summer after the last expected frosts. It would probably be worthwhile giving some protection to the plant for its first winter outdoors. Cuttings of half-ripe wood, 3 - 5cm with a heel, July/August in a frame. Pot up when roots are forming and keep in a frame or greenhouse for its first winter before planting out in late spring. Cuttings of mature wood, late autumn or winter in a frame.

nwatta Prefers a position in full sun, succeeding in most well-drained soils with some shelter from cold winds[200]. Dislikes very dry soils and water-logged soils. Tolerant of atmospheric pollution and maritime exposure[200]. Plants are hardy to about -15°c[184]. Hybridizes freely with other

members of this genus[200]. Plants of this species are often grown under the names of *H. buxifolia* or *H. subalpina* in British gardens[200]. This species is very easy to transplant and, with care, it can even be moved when in flower[200]. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 6.2.654 Opopanax chironium

Opopanax

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.8 m hkcw htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfkrxre7t hjonli

drutta Opopanax chironium is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from October to August, in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: GumNone known

tcanta GumA gum is obtained through incisions in the roots at the base of the stems[4]. It is used in perfumery[1, 46, 61] and also in medicines[171]. The gum is inflammable, burning brightly[4].

dwatta Antispasmodic DeobstruentThe gum (an oleo resin according to one report) that is obtained from the base of the stems is antispasmodic and deobstruent[4]. It is nowadays considered to be a medium of feeble powers though it was at one time widely used in the treatment of menstrual disorders, asthma, chronic visceral afflictions etc[4].

propta Seed - sow spring in situ. If seed is in short supply then it is best to sow it in a pot in the greenhouse in early spring. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer.

nwatta An easily grown plant, it succeeds in any good garden soil[1]. It can tolerate very considerable neglect, some plants we were growing were left to fend for themselves in very dense weed growth and survived well for 8 years before being moved to another site[K]. We are not sure how hardy this plant is, but the foliage has withstood short periods of temperatures down to -6°c with us[K]. A warm climate is necessary in order to produce good quality gum[4]. Plants seem to be very tolerant of root disturbance, specimens that had been growing for 4 years in one site grew away very well when transplanted as they came into growth in late autumn[K].

## 6.2.655 Aconitum chinense

5 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1.2 m hkcw hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Aconitum chinense is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Analgesic Anodyne Carminative Diaphoretic Diuretic Irritant SedativeThe root is analgesic, anodyne, carminative, diaphoretic, diuretic, irritant, sedative[4, 7, 9, 145, 165]. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner.

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54].

## 6.2.656 Aconitum ferox

Indian aconite

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyikfrp hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Aconitum ferox is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The flowers are pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Alternative Anaesthetic Antiarthritic Cholera Deobstruent Diaphoretic Diuretic Leprosy Sedative Stimulant-The dried root is alterative, anaesthetic, antiarthritic, deobstruent, diaphoretic, diuretic, sedative, stimulant[178]. It is best harvested in the autumn as soon as the plant dies down. This is a very poisonous plant and should only be used with extreme caution and under the supervision of a qualified practitioner. It has been used in India and Nepal in the treatment of neuralgia, leprosy, fevers, cholera and rheumatism[240, 272]. When the roots are soaked in cow's urine, they become soft and lose their depressant action on the heart, becoming a stimulant instead[240].

propta Seed - best sown as soon as it is ripe in a cold frame[111]. The seed can be stratified and sown in spring but will then be slow to germinate[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Division - best done in spring but it can also be done in autumn[1, 111]. Another report says that division is best carried out in the autumn or late winter because the plants come into growth very early in the year[233].

nwatta Thrives in most soils and in the light shade of trees[1]. Grows well in heavy clay soils. Prefers a moist soil in sun or semi-shade[200]. Prefers a calcareous soil. Grows well in open woodlands[1, 4]. The root of this plant is widely collected from the wild for medicinal use and is becoming much rarer in much of its range[272]. Members of this genus seem to be immune to the predations of rabbits and deer[233]. A greedy plant, inhibiting the growth of nearby species, especially legumes[54]. Closely related to *A. napellus*[1].

## 6.2.657 Lobelia siphilitica

Great Blue Lobelia, Blue Cardinal Flower, Big Blue Lobelia, Great Lobelia

5 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc  
hmimhtut cyuti tucphja7n hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Lobelia siphilitica is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta None known  
tcanta None known  
dwatta Analgesic Cathartic Diaphoretic Dysentery Emetic Homeopathy Poulitice VDThe root is cathartic, diaphoretic and emetic[4, 46, 103]. It is used in the treatment of dropsy, diarrhoea, stomach complaints, syphilis and dysentery[4, 257]. A poultice of the root has been applied to sores that are hard to heal[257]. The leaves are analgesic and febrifuge[257]. An infusion has been used in the treatment of colds and fevers[257]. A poultice of the crushed leaves has been applied to the head to relieve the pain of headaches[257]. At one time in N. America the root of this plant was believed to be effective in the treatment of VD[103, 222]. When used in Europe, however, it was found to be ineffective[213]. This might have been because the N. American Indians used the fresh root (which still contained the volatile oils) and also used it in conjunction with *Podophyllum peltatum* and *Prunus virginiana*, and then dusted the ulcers with the bark of *Ceanothus americanus*[213]. It was believed by some native North American Indian tribes that if the finely ground roots were secretly added to the food of an arguing couple then this would avert a divorce and they would love each other again[213]. A homeopathic remedy is made from the roots[4].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring[200]. Basal cuttings in spring[1]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Layering in moist sand, it forms roots at the nodes[200].

nwatta Landscape Uses:Border, Massing, Woodland garden. Requires a moist soil, succeeding in full sun or partial shade[111, 187, 200]. A very ornamental plant[1], but it is short-lived unless divided frequently[233]. Special Features:Attracts birds, North American native, Naturalizing, All or parts of this plant are poisonous, Wetlands plant, Attracts butterflies, Suitable for cut flowers.

## 6.2.658 Hypericum bellum

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Hypericum bellum is an evergreen Shrub growing to 1 m (3ft 3in) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta MiscellanyA good ground cover[11].  
dwatta Dysentery Febrifuge Miscellany Vermifuge-Febrifuge, vermifuge. Also used in the treatment of hepatitis, colds, dysentery and dermatitis[91].

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 12 cm with a heel, July/August in a frame. Plant in the following spring[200] Careful division of old suckering shrubs in the dormant season.

nwatta Easily grown in any reasonably good well-drained but moisture retentive soil[11]. Succeeds in sun or

semi-shade but flowers better in a sunny position[200]. Tolerates chalk. A very ornamental plant[11], it is hardy to about -10°C[184]. Plants in this genus are notably resistant to honey fungus[200].

## 6.2.659 Phoradendron leucarpum

False Mistletoe, Oak mistletoe

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli nyanhjen hjonli

drutta Phoradendron leucarpum is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from February to April, and the seeds ripen from November to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Abortifacient Contraceptive OxytoxicA tea made from the leaves is said to procure abortions and also to prevent conception[213]. It causes an increase in uterine contractions and helps to stop bleeding after parturition[213]. When injected into the blood it increases blood pressure[213].

propta This is a parasitic plant that grows entirely on the host tree. To grow it you need to obtain berries and squash them onto the branches of host trees in late autumn and early winter[11]. This is best done on the lower side of the branch[1]. It is then simply a matter of waiting and hoping.

nwatta A parasitic plant, growing on the branches of several deciduous species of trees. It has a wide range of hosts, though it is usually only found on one species in any given area[200]. The host tree must be at least 20 years old[200]. This species is seldom cultivated since it can severely weaken its host[200].

## 6.2.660 Ligusticum sinense

Chuang Xiong

5 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 1 m hkuc  
htut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta Ligusticum sinense is a PERENNIAL growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Analgesic Antifungal Antirheumatic Antispasmodic Diaphoretic Emmenagogue SedativeThe root is anodyne, antibacterial, antifungal, antirheumatic, antispasmodic, emmenagogue, diaphoretic, hypotensive and sedative[176, 218, 238]. It is taken internally in the treatment of menstrual disorders, post-partum bleeding, coronary heart disease, poor circulation, headaches etc[238]. It is soaked in alcohol for 2 weeks and then used in the treatment of gout[218]. The root is harvested in the autumn and dried for later use[238].

propta The seed is best sown as soon as it is ripe in a cold frame in the autumn. Stored seed should be sown as early in the year as possible in a greenhouse or cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer if they have grown large enough. Otherwise, keep them in a cold frame for the first winter and plant them out in early summer. Division in spring.

nwatta Succeeds in any well-drained soil in a sunny position[1, 200]. Tolerates moister conditions than many other members of the genus[238]. Plants are hardy to at least -15°C[238].

## 6.2.661 Veratrum nigrum

Black Hellebore

5 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyuti tcup hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Veratrum nigrum is a PERENNIAL growing to 1.5 m (5ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta InsecticideThe dried and powdered root is used as an insecticide and a parasiticide[172]. It is also effective against caterpillars and mammals so great caution is advised[1, 19, 20].

dwatta Analgesic Anthelmintic Emetic Errhine Expectorant Laxative VermifugeThe root is anthelmintic, emetic, errhine, expectorant, laxative and vermifuge[178, 218]. This herb is highly toxic and should not be used internally, or even externally, without expert guidance[K]. The whole plant is analgesic[218].

propta Unless stored in damp sand at around 4°C the seed has a short viability[200]. Where possible it is best to sow the seed in a lightly shaded position in the greenhouse as soon as it is ripe[200]. Stored seed needs to be stratified but can be very slow to germinate. Germination can be erratic even for seed sown when it was fresh, it usually takes place within 3 - 12 months at 15°C but can be much longer[200]. The plant produces just one seedleaf in its first year, this forms an over-wintering bulb. It takes up to 10 years for the plant to reach maturity[200]. Sow the seed thinly so there is no need to thin or transplant them, and grow the seedlings on undisturbed in the pot for their first two years of growth. Apply a liquid feed at intervals through the growing season to ensure the plants do not become nutrient deficient. At the end of the second year plant out the dormant plants into individual pots and grow them on in light shade in the greenhouse for a further year or two before planting them out into their permanent positions in late spring or early summer. Division in March/April or in October. Establish the plants in pots in a shaded frame before planting them out[200]. Division is best carried out in the autumn because the plants come into growth very early in the spring[233]. Root cuttings, 6mm long with a bud, rooted in a sandy soil in a cold frame[200].

nwatta Requires a deep fertile moisture retentive humus-rich soil[200]. Succeeds in full sun if the soil does not dry out but prefers a position in semi-shade[200]. Dislikes dry soils[42]. Grows best in a cool woodland garden or a north facing border[42]. Plants are hardy to about -25°C[187], especially if they are given a protective mulch in the winter. The flowers smell of rotten fruit and are visited by flies[187]. Members of this genus are rarely if ever troubled by browsing deer[233]. Plants are long-lived and can be left in the same position for years without attention[233].

## 6.2.662 Cyrilla racemiflora

Leatherwood, Swamp titi, Black Titi, Swamp, Myrtle, Titi Swamp, Leatherwood

5 tlin 10 cyuc 0 kcaak 0 tcan 1 dwat 1.2 m hkuc  
htut cyuti tcup hwicli hrasljut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Cyrilla racemiflora is a deciduous Shrub growing to 1.2 m (4ft) by 2 m (6ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf from April to October, in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium

used to make a good quality paper[269]. This plant is currently (1995) under investigation at Rosewarne in Cornwall as a potential commercial paper crop for small-scale industries in SW England[K]. Because of rather high yields from natural stands, the plant has been suggested as a source of biomass for energy production[7, 269]. Dry cane yields of ca 10, 15, and 20 tonnes per hectare were reported respectively from infertile, partly fertile and fertile soils[269]. According to the phytomass files annual productivity ranges from 10 to 59 tonnes per hectare, the latter figure from Westlake's (1963) estimate of 57 - 59 tonnes[269]. In addendum, Westlake cites evidence that *Arundo donax* can produce 40-75 MT/ha/yr. in warm temperate and tropical regions. Early vegetative growth has ME (metabolizable energy) of 2.22 megacalories/kg DM, while hay has an ME of only 1.37 (Gohl, 1981). Such annual productivity, if sustainable, makes this a notable energy candidate, especially when one considers the energy as a by-product, with leaf protein and potential pharmaceutical as primary products[269]. A particular type of cellulose is obtained from the plant[7]. In Italy, the plant is used in the manufacture of rayon[269]. Bio-fuel crop.

**dwatta Diaphoretic Diuretic Emollient Galactofuge Hypotensive**The root is diaphoretic, diuretic, emollient and galactofuge[7]. An infusion is said to stimulate menstrual discharge and diminish milk flow[240, 272]. A paste of the root is applied to the forehead to treat headaches[272]. Isolated alkaloids have been experimentally shown to raise the blood pressure and contract the intestine and uterus[240]. The rhizome or rootstock is used in the treatment of dropsy. Boiled in wine with honey, the root or rhizome has been used for treating cancer[269]. The plant contains the alkaloid gramine. This is said to be a vasopressor, raising the blood pressure in dogs after small doses, causing a fall in larger doses[269]. The stems have been used as splints for broken limbs[257].

**propta Seed** - surface sow in a greenhouse in February to April. Stand the pots in about 3cm of water to keep the soil moist until the seed germinates. It usually germinates in 1 - 3 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Once they are 20cm or more tall, plant them out into their permanent positions in late spring or early summer. Division in spring[1]. Whilst large divisions can be planted out direct into their permanent positions, we have found that it is best to pot the divisions up and keep them in light shade in a greenhouse until they are rooting away well. Stem cuttings, planted in water, root easily[1].

**nwatta Fodder:** Bank Industrial Crop: Biomass Management Hay Minor Global CropLandscape Uses:Container, Screen, Specimen, Winter interest. Prefers a moist fertile soil in a sunny sheltered position, preferably by water[1, 134, 200]. Tolerates a pH in the range 5.5 to 8.3. Plants can be grown as a specimen in lawns etc, succeeding in quite coarse grass[233]. Plants are succeeding in a site that is very exposed to maritime winds at Rosewarne in Cornwall[K]. Adapted to tropical, subtropical and warm temperate climates of the World, Giant reed is often found on sand dunes near seashores. It tolerates some salt. It grows best along river banks and in other wet places, and is best developed in poor sandy soil and in sunny situations. Said to tolerate all types of soils, from heavy clays to loose sands and gravelly soils. Ranging from Cool Temperate Wet through Tropical Dry to Wet Forest Life Zones, giant reed is reported to tolerate annual precipitation of 30 to 400cm, an average annual temperature range of 9 to 28.5°C and a pH in the range of 5.0 to 8.7[269]. One report says that this plant is only hardy in the milder areas of Britain[1] whilst another report says that it is hardy to between -5 and -10°C[200]. This contradicts with the hardness zone rating of 6 which would make the plant hardy in most areas of Britain[200]. Plants thrive outdoors at Oxford Botanical Gardens[233] as well as at Hilliers Arboretum in Hampshire and the RHS Gardens in Surrey[K]. Extensively cultivated in S. Europe for basket making etc[50]. Plants rarely if ever flower in British gardens[233]. Members of this genus are rarely if ever troubled by browsing deer[233]. **Special Features:** Attracts birds, Attractive foliage, Not North American native, Naturalizing, Wetlands plant, Suitable for cut flowers, Suitable for dried flowers, Attractive flowers or blooms.

## 7.2.99 Brassica napus

Colza, Rape

6 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 1.2 m hkuc hminhtut cyutili tcup hwicli hrasjlutnykfrif hpa7tli frusflat-prikliwsslip hpa7tmwatli fyfixre7t hjonli

**drutta Brassica napus** is a ANNUAL/BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves Oil Oil Seed Stem**Edible Uses:** Condiment Oil OilLeaves - raw or cooked[4, 34, 37]. Added to salads or used as a potherb[183, 272]. The leaves are also fermented for later use[272]. Immature flowering stems - cooked in much the same way as broccoli[183]. An edible oil is obtained from the seed, it is used mainly for cooking purposes, but can also be used raw in salad dressings[4, 13, 34, 46, 183]. Some caution is advised, however, see the notes above on toxicity. The sprouted seed is often used as the mustard part of mustard and cress. Eaten in salads[4, 34, 37, 183]. The seed is used as a mustard flavouring[183].

**tcanta Green manure Oil Oil**The seed contains up to 45% of an edible semi-drying oil, it is used as a luminant, lubricant, in soap making etc[13, 21, 57, 142]. Rapeseed oil has potential market in detergent lubrication oils, emulsifying agents, polyamide fibres, and resins, and as a vegetable wax substitute. According to the Chemical Marketing Reporter (April 26, 1982) "the most common use for the oil is still in the production of erucic acid, a fatty acid used in turn in the manufacture of other chemicals[269]. The seed husks are used in plastering house walls[272]. A good green manure, the deep taproot improves drainage and loosens heavy soils[18, 20, 87].

**dwatta Diuretic Emollient**The root is emollient and diuretic[240]. The juice of the roots is used in the treatment of chronic coughs and bronchial catarrh[240, 269]. The seed, powdered, with salt is said to be a folk remedy for cancer[269]. Rape oil is used in massage and oil baths, it is believed to strengthen the skin and keep it cool and healthy. With camphor it is applied as a remedy for rheumatism and stiff joints[269]. It is dropped into the ear to relieve ear-aches[272].

**propta Seed** - sow in situ in early spring to mid-August for a green manure crop.

**nwatta** Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Succeeds in any reasonable soil[52]. Prefers a heavy soil and cool moist conditions[16, 20]. Sunny days and cool nights are favourable for plant growth whilst dry weather at harvest time is essential[269]. Colza is reported to tolerate an annual precipitation of 30 to 280cm, an annual average temperature range of 5 to 27°C and a pH in the range of 4.2 to 8.2[269]. Very young plants are susceptible to cold damage, -4°C either killing or injuring seedlings, whereas -2°C has no effect when the plants are more than one month old[269]. *Brassica napus* is an aggregate species, probably derived through cultivation. It is thought that crosses of *Brassica oleracea* subsp. *oleracea* with *B. rapa* gave rise to the subsp. *B. napus pabularia*, from which subsp. *napus* and subsp. *rapifera* and other cvs were derived[269]. The aggregate species includes forms with swollen edible roots (*B. napus napobrassica*, the garden swede), forms grown for their oil-rich seeds (*B. napus napus*, the oilseed rape), forms grown for their edible leaves (*B. napus pabularia*, the rape kales) whilst the form grown as a green manure is *B. napus arvensis*. All these forms are treated separately here. The oil obtained from the seed is high in erucic acid and glucosinolates, both of which have anti-nutritional properties. Cultivars have been developed that have a low content of these items and are therefore suitable for food. Colza is 70% self-pollinating and 30% cross-pollinated. Even if wind and insects are absent, seed are still produced. Yield increases with honeybees[269]. The growth of this plant is inhibited by field mustard and hedge mustard growing nearby[18, 20]. This species is closely related to *B. rapa*[200].

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Flowers Leaves**Edible Uses:** Gum TeaYoung leaves - cooked. An aromatic flavour[2, 106, 178, 179]. They are used as a potherb[183]. Flowers - cooked. Eaten as a vegetable[183]. The dried leaves are a tea substitute[177, 183].

**tcanta Fodder Gum Plaster PlasterA** gummy extract of the plant is used as a plaster[178]. No more details are given. Wood - dense, hard, strong, takes a good polish. Used for furniture, industrial applications, firewood etc[74, 158, 272].

**dwatta Analgesic Anthelmintic Carminative Digestive Diuretic Oxytotic Plaster Plaster Sedative Stimulant Tonic Vulnerary**The flower heads are carminative, digestive, sedative and tonic[176, 218, 238]. They are used internally in the treatment of insomnia, irritability, breathlessness and poor memory[176, 238]. The flowers are harvested as they open and are dried for later use[238]. The stem bark is anodyne, anthelmintic, carminative, discutient, diuretic, oxytotic, sedative, stimulant, tonic, vermifuge and vulnerary[176, 178, 218]. It is used internally in the treatment of insomnia, irritability, boils and carbuncles[238]. Externally, it is applied to injuries and swellings[238]. The bark is harvested in spring or late summer and is dried for later use[238]. A gummy extract obtained from the plant is used as a plaster for abscesses, boils etc and also as a retentive in fractures and sprains[218].

**propta Seed** - pre-soak 24 hours in hot water and sow March/April in a greenhouse or sow as soon as it is ripe in a cold frame[113]. Germinates in 2 - 3 months at 19°C. Scarification helps[133]. There are about 11,000 seeds to a pound, about 25 - 33% of which germinate[227]. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer and consider giving them some protection from the cold for their first winter or two outdoors[K]. Root cuttings, late winter in a greenhouse[113, 200]. Cuttings of half-ripe wood, July/August in a frame[200]. Suckers planted out in late winter[200].

**nwatta Agroforestry Services:** Alley crop Agroforestry Services: Contour hedgerow Agroforestry Services: Crop shade Agroforestry Services: Nitrogen Fodder: Bank Fodder: Insect Industrial Crop: Biomass Management: Coppice Management: Standard Regional Crop**Requires** a well-drained moisture retentive soil and a very sunny position[200]. Succeeds in dry soils. Highly fertile soils can promote soft sappy growth which is frost tender[200]. Trees tolerate a high pH, saline soils, high winds and drought[200, 238]. They also succeed in poor soils[238]. Trees prefer a more continental climate than Britain[11] and when dormant are hardy to about -20°C in such a zone[200]. They are only hardy to about -10°C in the maritime climate of this country[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. They succeed on a sunny wall at Kew[11], and also in a more open but sunny sheltered position there[K], but only rarely succeed outdoors in the mildest areas of Britain[1]. If killed back to the ground by a severe winter, plants can often resprout from the base[200]. The form 'Rosea' is hardier and more compact, succeeding even in the drier parts of Britain if given some protection[11]. Plants are quite tolerant of pruning and can be fan-trained for growing on a wall. Any pruning is best done in late winter or early spring[202]. Often grown as a summer bedding plant[1]. Quite tolerant of being transplanted[200]. Plants often produce suckers[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. **Special Features:**Attracts birds, Attractive foliage, Not North American native, Invasive, Fragrant flowers, Blooms are very showy.

## 7.1.8 Alhagi maurorum

Camel Thorn

tfo2n 6 tlin 10 cyuc 2 kcaok 0 tcan 2 dwat m hkuc htut cyutili kyucup hwicli hrasjlut hpa7tli flatprikliwshsom hpa7tmwatli xre7t hjonli

**drutta Alhagi maurorum** is a deciduous Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Manna**Edible Uses:** A sweet-tasting manna is exuded from the twigs at flowering time[2, 22, 105, 177]. It is exuded during hot weather according to one report[1]. It contains about 47% melizitose, 26% sucrose, 12% invert sugar[114]. Another manna is obtained from the pods - it is sweet and laxative[61]. Root - cooked. A famine food, it is only used in times of need[46, 61, 177].

**tcanta None known**

**dwatta Diaphoretic Diuretic Expectorant Laxative**The whole plant is diaphoretic, diuretic, expectorant and laxative[46, 114]. An oil from the leaves is used in the treatment of rheumatism[238]. The flowers are used in the treatment of piles[238].

**propta Seed** - pre-soak the seed for 12 hours in warm water and sow March/April in a warm greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least the first winter. Plant out into their permanent positions in the summer. Cuttings of young shoots in a frame[1].

**nwatta** Requires a sunny position in a well-drained light or medium soil. Plants are not very hardy in Britain, they can be grown outdoors in the summer but require protection in the winter[1]. The stems of the plant are covered in sharp spines[245]. Like the closely related gorse (*Ulex europaea*) the flowers have a pineapple scent[245]. (A slightly strange report because the gorse flowers have a strong coconut fragrance[K]). This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 7.1.9 Acacia decurrens

Green Wattle

tfo2n 6 tlin 9 cyuc 2 kcaok 3 tcan 1 dwat 12 m hkuc htut cyutili kyucup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

**drutta Acacia decurrens** is an evergreen Tree growing to 12 m (39ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in April. The species is hermaphrodite (has both male and female organs). It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Flowers**Edible Uses:** Gum**Flowers** - cooked[144]. Rich in pollen, they are often used in fritters. A gum that exudes naturally from the trunk is edible and is used as a substitute for Gum Arabic in making jellies etc[46, 105, 177]. It is insoluble in water[153] and is of low quality[64]. Larger quantities can be obtained by tapping the trunk[64]. Some species produce a gum that is dark and is liable to be astringent and distasteful, but others produce a light gum and this is sweet and pleasant. It can be sucked like candy or soaked in water to make a jelly[193]. The gum can be warmed when it becomes soft and chewable[193].

**tcanta Dye Gum Hedge Hedge Soil stabilization Tannin**A yellow dye is obtained from the flowers[168]. A green dye is obtained from the seed pods[168]. The extensive root system of this plant helps to prevent soil erosion[200]. Often grown as a screen in Australia[157]. The bark contains about 40% tannin[61, 171]. On a 10% moisture basis, the bark contains 36.6% tannin[223].

**dwatta Astringent**The bark is astringent[4, 153]. It should be stored for 12 months before being used[4]. Its

main use is in the treatment of diarrhoea[4].

propta Seed - best sown as soon as it is ripe in a sunny position in a warm greenhouse[1]. Stored seed should be scarified, pre-soaked for 12 hours in warm water and then sown in a warm greenhouse in March. The seed germinates in 3 - 4 weeks at 25°C[133]. As soon as the seedlings are large enough to handle, prick them out into individual pots and grow them on in a sunny position in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts, and consider giving them some protection from the cold for their first winter outdoors. Cuttings of half-ripe wood with a heel, July/August in individual pots in a frame[78]. Overwinter in a greenhouse for the first winter and plant out in their permanent positions in late spring or early summer. Fair percentage[78].

nwatta Prefers a light sandy loam and a very sunny position sheltered from strong winds[1, 49, 89]. Succeeds in any good garden soil that is not excessively limey[11], it also succeeds in dry soils. Most species in this genus become chlorotic on limey soils[200]. Plants tolerate temperatures down to about -5°C[260]. This species is one of the hardiest members of the genus, it succeeds outdoors in the milder areas of the country, but even in Cornwall it can be killed back to the ground in excessively harsh winters[11]. It will, however, usually resprout from the base. Plants require hot, sunny summers if they are to ripen their wood fully and flower freely. In Britain they tend to do best when grown in coastal gardens in a sunny, sheltered position that is protected from the wind[11]. A fast-growing and very ornamental tree[1, 260], it is closely related to *A. dealbata*[11]. The cultivar 'Mollis' is notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 7.1.10 Ceanothus integerrimus

Deer Brush

tfo2n 6 tlin 9 cyuc 2 ckak 0 tcan 1 dwat 4 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Ceanothus integerrimus* is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked. Used as pineole[105, 161, 177, 257].

tcanta Basketry Dye Miscellany SoapA green dye is obtained from the flowers[168]. Young flexible shoots can be used for the circular withes of baskets[257]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K]. The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta MiscellanyThe plant has been used by some native North American Indian tribes to treat women who have suffered injury in childbirth[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place within 1 - 2 months at 20°C[138]. Another report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. It then requires a period of chilling below 5°C for up to 84 days before it will germinate[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry

container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. Requires a well-drained soil. This species is hardy to about -10°C[184, 200] according to some reports whilst another says that it requires a sheltered position or the protection of a wall when grown outdoors in Britain[1]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Any pruning is best carried out in the spring[219]. Fast growing but short lived, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

## 7.1.11 Phaseolus polystachios

Thicket Bean. Wild bean

tfo2n 6 tlin 10 cyuc 2 ckak 3 tcan 0 dwat 3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli hjonli

drutta *Phaseolus polystachios* is a CLIMBER growing to 3 m (9ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. The flowers are pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Seed SeedpodEdible Uses: Edible Portion: The seeds are eaten, fresh or dried. Seeds - cooked[1438 ]. The elongate seedpod can be 70mm long and 12 mm wide, containing black, squarish seeds around 6mm long, 6 - 7mm wide and 4mm thick[1555 ]. Carbon farming - Staple Crop: protein.

tcanta Carbon farming - Agroforestry Services: nitrogen.

dwatta None Known

propta Like many species within the family Fabaceae, once they have ripened and dried the seeds of this species may benefit from scarification before sowing in order to speed up and improve germination. This can usually be done by pouring a small amount of nearly boiling water on the seeds (being careful not to cook them!) and then soaking them for 12 - 24 hours in warm water. By this time they should have imbibed moisture and swollen - if they have not, then carefully make a nick in the seedcoat (being careful not to damage the embryo) and soak for a further 12 hours before sowing[ K ].

nwatta Agroforestry Services: Nitrogen Historic Crop Management: Standard Staple Crop: ProteinClimate: cold temperate to tropical. Humidity: humid. Found in the wild on a range of soils from clays to sands[1555 ]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[755 ]. Carbon Farming - Cultivation: historic crop. Management: standard. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root

soil. Succeeds in most soils. Although given a hardiness rating of 9 in [200] (which means that a plant is not very frost-tolerant), this species is thriving in a sunny bed at Kew Botanical Gardens and so should be hardy to at least zone 7[K]. Another report says that it withstands temperatures down to about -40°C when dormant. Yet another report says that it should succeed outdoors in the milder and drier counties, but that it is not very long-lived[233]. The flowers are very attractive to bees. The flowers are pink or red.

## 7.2.96 Asarum caudatum

Wild Ginger. British Columbia wildginger

6 tlin 10 cyuc 3 ckak 0 tcan 2 dwat 0.1 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Asarum caudatum* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: Condiment TeaThe root can be used as a ginger substitute[183]. The root has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic. It can be harvested all year round, but is best in the autumn[K]. It can also be dried for later use[K]. Leaves are a tea substitute[177, 183].

tcanta A useful ground-cover plant for deep shade[187], spreading by its roots[208].

dwatta Analgesic Antirheumatic Appetizer Laxative Poulitce Stomachic TonicThe root is laxative, stomachic and tonic[61, 257]. A tea made from the root is used in the treatment of colds, colic, indigestion and stomach pains[213, 257]. The root is harvested in the autumn and dried for later use[238]. The whole plant is analgesic, antirheumatic, appetizer and tonic[257]. A decoction is used externally to treat headaches, intestinal pain and knee pains[257]. A poultice made from the heated leaves is applied to boils, skin infections and toothaches, whilst a decoction of the leaves is used as a wash on sores[257].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Landscape Uses:Ground cover, Woodland garden. Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are hardy to at least -15°C[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200]. Special Features:Attractive foliage, North American native, Fragrant foliage, Inconspicuous flowers or blooms.

## 7.2.97 Allium drummondii

Prairie Onion, Drummond's onion

6 tlin 9 cyuc 3 ckak 0 tcan 2 dwat 0.3 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Allium drummondii* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[161, 177, 257]. Used mainly as a condiment[177], the bulb is also eaten as a vegetable[183]. The bulb is rather small, up to 25mm tall and 15mm in diameter[235]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[1]. Succeeds in the rock garden, though in cold wet areas it is best grown in a bulb frame or cold greenhouse[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. The plants are much liked by grazing animals and have become rare or absent on pasture land[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.98 Arundo donax

Giant Reed, Giant Reed Grass

6 tlin 10 cyuc 3 ckak 4 tcan 2 dwat 6 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta *Arundo donax* is a PERENNIAL growing to 6 m (19ft) by 4 m (13ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Leaves RootEdible Uses: Rhizome - raw or cooked[84]. The rhizome can be dried and ground into a powder to make bread, usually in conjunction with cereal flours[7, K]. It can also be roasted or boiled[84]. Leaves - cooked as a potherb[84]. They are very bitter[177]. The young shoots are used[177].

tcanta Basketry Biomass Broom Dye Fodder Hedge Hedge Musical Paper Pipes Plant support Shelterbelt Soil stabilization Thatching WeavingBrooms are made from the terminal panicles[7]. Plants are grown alongside irrigation canals to check soil erosion[169]. The plant can be grown as a windbreak screen[1, 169]. If cut down, the culms branch and in this form the plants can be used as a hedge[236]. The leaves can be woven into mats etc, whilst the split and flattened stems are used to make screens, walls of houses etc[46, 50, 61, 84]. A yellow dye is obtained from the pollen[257]. The stems of the plant have a multitude of applications. They are used as plant supports for vines and other climbing plants[7, 169, 269] and to make clarinets, bag-pipes etc[46, 61, 103]. They are also used as pipe stems[84], for roofing[46], to make screens, walking sticks and in basketry[100, 195]. They are used to make the reeds of clarinets and organ pipes[236]. The stems can be harvested as desired at any time of the year[269]. The fibre from the stems can be



81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in dry soils, tolerating drought once it is established[185]. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[11]. Prefers a limestone soil, growing well on chalk, but it also succeeds in very acid soils[200]. Grows well on dry banks[200]. A very ornamental plant[1] that is fairly fast growing for a juniper[81, 185]. A tree at Westonbirt Arboretum was 7 metres tall after 23 years[81, 185]. This species is resistant to honey fungus[88]. Cones are rarely if ever produced in Britain, could this be due to a lack of female trees?[1] Only male trees have been seen in cultivation in Britain[185]. Seed takes 2 years to mature[200]. Dioecious. Male and female plants must be grown if seed is required.

### 7.2.93 Allium giganteum

Giant Onion, Ornamental Onion

6 tin 10 cyuc 3 kcaak 0 tcan 2 dwat 2 m hkuc

htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Allium giganteum is a BULB growing to 2 m (6ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[K]. We have seen no reports of edibility, but the bulb is certainly not poisonous and has a pleasant mild onion flavour[K]. The fairly large bulbs are 4 - 6cm in diameter[200]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Landscape Uses:Container, Foundation, Massing, Rock garden, Specimen. Prefers a hot, sunny position in a light well-drained soil[1], it grows well in the light shade of thinly-clad shrubs that also like hot dry conditions[200]. The bulbs tend to rot when grown in cool wet climates, even if they are given sharp drainage[203]. One report says that this species is only hardy to zone 8, which only covers the mildest areas of Britain[200], whilst another says that it is much harder and will succeed in zone 4[203]. It is being grown successfully about 60 kilometres west of London, and so should be hardy at least in the south of Britain[242]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses,

carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Attracts butterflies, Suitable for cut flowers, Suitable for dried flowers.

### 7.2.94 Lallelantia iberica

6 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.5 m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lallelantia iberica is a ANNUAL/BIENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil Oil SeedEdible Uses: Oil OilLeaves - cooked and used as a potherb[46, 61, 105, 177, 183]. Seed - raw or cooked. It is rich in oil[2]. An edible oil is obtained from the seed[2, 6, 105, 177, 183].

tcanta Oil OilThe seed contains up to 30% of a drying oil[61]. It is used for lighting, as a varnish, in paints and as a lubricant[46, 57, 74]. It is a linseed substitute[114]. Linseed oil has a very wide range of applications including use as a wood preservative, an ingredient of oil-based paints, furniture polishes, printer's inks, soap making etc[46, 57, 244]. It is also used in the manufacture of linoleum[169].

dwatta None known

propta Seed - sow April in situ[1]. Very fast germination[K].

nwatta Requires a light well-drained soil in a sunny position[200]. Prefers a cool situation[1]. Often grown in the ornamental garden[50]. The flowers are very attractive to bees[74].

### 7.2.95 Agastache mexicana

Mexican Giant Hyssop

6 tin 10 cyuc 3 kcaak 2 tcan 0 dwat m hkuc

htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Agastache mexicana is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaThe highly aromatic young leaves are used as a flavouring in salads and cooked foods[183]. The young leaves are used to make a herbal tea[183].

tcanta Attracts wildlife. The flowers are very attractive to bees.

dwatta None known

propta Seed - sow spring in a greenhouse and only just cover the seed. The seed usually germinates in 1 - 3 months at 13°C[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant out in late spring or early summer[K]. Division in spring. Fairly simple, if large divisions are used it is possible to plant them straight out into their permanent positions. Basal cuttings of young shoots in spring[111]. Harvest the young shoots when they are about 10 - 15cm tall and pot them up in a lightly shaded position in a greenhouse. They should root within 3 weeks and can be planted out in the summer or following spring.

nwatta A perennial plant. It can be grown as an annual. Prefers a warm sunny sheltered position and a well-drained

pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous.

#### 7.1.12 Ceanothus cuneatus

Buckbrush, Sedgeleaf buckbrush, Monterey ceanothus

tfo2n 6 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.8 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Ceanothus cuneatus is an evergreen Shrub growing to 1.8 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: TeaSeed[94]. No more details are given. The leaves and flowers make an excellent tea when steeped in boiling water for about 5 minutes[183].

tcanta Dye SoapA green dye is obtained from the flowers[168]. A red dye is obtained from the root[94]. The stems have been used as rods in basket making[257]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[94, 168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K].

dwatta Astringent Digestive Hepatic Pectoral TonicAstringent, digestive, pectoral, tonic. A liver tonic[94].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place in 1 - 2 months at 20°C[138]. One report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Prefers a light soil with a low lime content[108]. Tolerates some lime, but will not succeed on shallow chalk[200]. Plants dislike root disturbance, they should be planted out into their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Plants flower on the previous year's growth, if any pruning is necessary it is best carried out immediately after flowering[200, 219]. Constant pruning to keep a plant small can shorten its life[200]. A fast-growing plant, it flowers well when young, often in its second year from seed[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212].

### 7.1.13 Lupinus littoralis

Seashore Lupine

tfo2n 6 tin 9 cyuc 2 kcaak 3 tcan 0 dwat 0.5 m hkuc

htut cyutli hgattcup hwicli hyishrasjlutnyik hpa7tli frusflat-prik hpa7tmwatli xre7t hjonli

drutta Lupinus littoralis is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[257]. The root can be dried and roasted[2, 44, 61, 161]. A sweet flavour; almost like sugar[256]. The tough and fibrous roots are rich in starch[2]. The root is roasted and then pounded to loosen the edible fibres from the stem[118]. The roasted, dried and powdered root can be stored for winter use[256]. The roots can be up to 1 metre long[256]. Lupine roots are best not eaten raw since they contain alkaloids that could be poisonous - North American Indians would fall into a drunken sleep if they ate them raw, though they are perfectly safe when cooked[256].

tcanta Green manureA good green manure plant for poor soils[61]. It is quite fast growing and fixes atmospheric nitrogen.

dwatta None known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a greenhouse[1, 200]. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. It should also be possible to sow the seed in situ in mid spring. It might be necessary to protect the sowing from mice. Division in March. Difficult. Basal cuttings, April in a cold frame. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta An easily grown plant, succeeding in any moderately good soil in a sunny position[1, 200]. It strongly dislikes excessive winter wet[1]. Requires an acid to neutral soil[200]. Succeeds in poor soils[60]. Plants dislike root disturbance. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 7.1.14 Cercis chinensis

Chinese Redbud

tfo2n 6 tin 8 cyuc 1 kcaak 0 tcan 2 dwat 15 m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cercis chinensis is a deciduous Tree growing to 15 m (49ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Although no records of edibility have been seen for the seed, on a zero moisture basis it contains 16.6% protein, 9.2% fat and 2.8% ash[218].

tcanta None known

dwatta Anthelmintic Diuretic Women's complaintsTreats bladder diseases, post-partum discharges, bleeding piles and internal parasites[178]. The wood and the bark have been used to treat abscesses, bladder ailments and head troubles[218].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Pre-soak stored seed for 24 hours in warm wa-

ter then cold stratify for 3 months[113]. Sow spring in the greenhouse[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants resent root disturbance and are best planted out in their permanent positions as soon as possible[11]. Cuttings of half-ripe wood, July/August in a frame[200].

nwatta Landscape Uses:Border, Massing, Specimen. Succeeds in most soils and pH types, but dislikes growing in wet soils, especially when these are of clay[200]. Prefers a deep damp sandy loam and a very sunny position[11, 182]. Dislikes drought[200]. Repays generous treatment[11]. Although the dormant plant is cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This species does not flower very freely in Britain. Plants do not thrive at Kew, they prefer a hotter climate[11]. The flowers are produced on the branches of the previous or earlier years, and also on the trunk of the plant[82]. Plants are susceptible to coral spot fungus, especially in areas with cooler summers where the wood is not fully ripened[11]. Plants in this genus are notably resistant to honey fungus[200]. Resents root disturbance, plants should be planted into their permanent positions as soon as possible, preferably in May, and should be kept well watered until established[11]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Blooms are very showy.

### 7.1.15 Gleditsia caspica

Caspian Locust

tfo2n 6 tlin 8 cyuc 1 kcak 0 tcan 0 dwat 12 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta Gleditsia caspica is a deciduous Tree growing to 12 m (39ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: SeedEdible Uses: The seed of several species can be eaten raw or cooked. This species often crops well in this country and so some research into its potential edibility would be desirable[K].

tcanta SoapThe closely related *G. sinensis* has a saponaceous pulp inside the seed pod that can be used as a soap substitute[11]. It is quite probable that this species can be similarly used[K]. Wood - strong, durable, coarse-grained[82].

dwatta None known

propta Seed - pre-soak for 24 hours in warm water and then sow in spring in a greenhouse[78]. The seed should have swollen up, in which case it can be sown, if it has not swollen then soak it for another 24 hours in warm water. If this does not work then file away some of the seed coat but be careful not to damage the embryo[78]. Further soaking should then cause the seed to swell. One it has swollen, the seed should germinate within 2 - 4 weeks at 20°C. As soon as they are large enough to handle, prick the seedlings out into individual deep pots and plant them out into their permanent positions in the summer. Give the plants some protection from the cold for their first few winters outdoors.

nwatta Landscape Uses:Rock garden, Specimen. Easily grown in a loamy soil, requiring a sunny position[11]. Succeeds in most soils[200] including sandy ones[188]. Established plants tolerate drought[1] and atmospheric pollution[200]. This species is often confused in cultivation with the closely related *G. sinensis*, many of the trees grown under that name are this species[11]. This tree is remarkable for the number and length of the spines growing on its

trunk, which makes it the most formidably armed of temperate trees[11]. Trees have a light canopy, they come into leaf late in the spring and drop their leaves in early autumn[200] making them an excellent top storey tree in a woodland garden. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Fragrant flowers, Inconspicuous flowers or blooms.

### 7.1.16 Indigofera heterantha

Indigo Bush

tfo2n 6 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 3 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Indigofera heterantha is a deciduous Shrub growing to 3 m (9ft) by 2.5 m (8ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf from May to November, in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FlowersEdible Uses: The flowers are boiled and pickled[272].

tcanta Basketry FuelThe branches are used in basket making and in making twig bridges[146, 158]. They are also used as a fuel[145, 158].

dwatta None known

propta Pre-soak the seed for 12 hours in warm water and sow February in a warm greenhouse. The germination can be variable. Prick out the seedlings when large enough to handle and overwinter the young plants in a greenhouse for the first winter, planting out in late spring or early summer after the last expected frosts[78]. Cuttings of half-ripe wood, 5 - 8cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Overwinter the young plants in a greenhouse for the first winter and plant out in late spring or early summer[11]. Root cuttings 3cm long in December. Good percentage[78]. Suckers. Remove them in the dormant season, preferably towards the end of winter, and plant out into their permanent positions.

nwatta Requires a light or medium well-drained soil and a sunny position[11, 200]. Succeeds on chalk[11]. Succeeds in full sun in most well-drained soils[184], including dry ones[182, 202]. Tolerates light shade[202]. The root-stock is hardy to about -15°C[184, 200] and plants resprout from the base if they are cut back by winter cold. Plants are cut back to the ground in most winters at Kew though they are all right in the milder areas of the country[11]. They flower on the current years growth[184] and flower more freely if they are pruned to the ground during the winter or early spring[219]. They do not come into new growth until quite late in the spring[219]. A very ornamental plant[1]. Fast-growing when young, but slowing with age[200]. The flowers have a vanilla scent[245]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

### 7.1.17 Indigofera pseudotinctoria

Indigo

tfo2n 6 tlin 10 cyuc 1 kcak 0 tcan 0 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwisslip hpa7tmwatli xre7t hjonli

drutta Indigofera pseudotinctoria is a deciduous Shrub growing to 1 m (3ft 3in) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suit-

### 7.2.90 Viburnum grandiflorum

Cranberry bush,

6 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum grandiflorum is a deciduous Shrub growing to 2 m (6ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from January to March. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[11, 51, 105, 272]. A sweet flavour[K]. The ovoid fruit is about 20mm long and contains a single large seed[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. Requires shelter from north and east winds[200]. A very ornamental plant[1], the deliciously scented flowers are produced in the winter and the flowers are said to withstand temperatures down to -12°C without damage[11, 200]. However fruit is not often produced in this country[K]. This may be due to the plant being self-incompatible and so growing 2 or more different cultivars together may improve fruit set[11, 200]. Hand pollination may also be beneficial as well as sitting the plants so that they get the maximum of protection from severe winter weather[K]. A position against an east-facing wall, or on the edge of a woodland, would be ideal for this[K]. Closely allied to *V. farrieri*. The very closely related species *V. foetens*, which is often included as part of this genus, has a more westerly range, shorter stems and white flowers.

### 7.2.91 Oxalis oregana

Redwood Sorrel

6 tlin 9 cyuc 3 kcak 3 tcan 1 dwat 0.2 m hkuc pcmhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Oxalis oregana is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year; in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers

moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[118, 183, 257]. A acid, flavour, it is especially adored by children and makes an excellent addition to mixed salads[K]. The leaves can be harvested all year round[K]. A mass of the leaves and stems can be allowed to ferment slightly when they make a tasty dessert[183]. A sort of rhubarb pie can be made from the leaf stalks[183]. The leaf stalks are very thin - you would need an awful lot for a pie[K]. Use in moderation, see notes above on toxicity. Flow-ers - raw[K]. A pleasant acid flavour[K].

tcanta A good ground cover plant for a woodland garden[197, 208], though it can be invasive[60]. It needs weeding for the first year or so[197].

dwatta Antirheumatic Ophthalmic PoulticeA decoction of the whole plant has been used as a wash in the treatment of rheumatism[257]. The fresh juice of the plant has been used as eye drops to ease sore eyes[257]. A poultice of the wilted leaves has been used as a dressing on boils, sores and on swollen areas of the skin[257].

propta Seed - best sown as soon as ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a moisture-retentive humus-rich soil in shade or dappled sunlight[200]. Succeeds in dense shade[187]. Grows well in a wild or woodland garden[200]. Plants can be very invasive when in suitable conditions[60]. Plant is growing very vigorously in quite dense shade under an *Elaeagnus* shrub in Cornwall - it stays green all year round and is fairly productive[K]. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 7.2.92 Juniperus drupacea

Syrian Juniper

6 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 15 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli frusflat-priklwisslip hpa7tmwatli nyanhjen hjonli

drutta Juniperus drupacea is an evergreen Tree growing to 15 m (49ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Large and sweet[2, 61, 105].The cones are about 20 - 25mm in diameter and take 2 years to mature[200].

tcanta None known

dwatta None known

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78,

cyanate) is used in commercial cat and dog repellent mixtures[269].

dwatta Antirheumatic Appetizer Digestive Diuretic Emetic Epilepsy Rubefacient StimulantMustard seed is often used in herbal medicine, especially as a rubefacient poultice[4]. The seed is ground and made into a paste then applied to the skin[4, 21, 46, 213] in the treatment of rheumatism, as a means of reducing congestion in internal organs[4, 222]. Applied externally, mustard relieves congestion by drawing the blood to the surface as in head afflictions, neuralgia and spasms. Hot water poured on bruised seeds makes a stimulant foot bath, good for colds and headaches. Old herbals suggested mustard for treating alopecia, epilepsy, snakebite, and toothache[269]. Care must be taken not to overdo it, since poultices can sometimes cause quite severe irritation to the skin[K]. The seed is also used internally, when it is appetizer, digestive, diuretic, emetic and tonic[4, 21, 46]. Swallowed whole when mixed with molasses, it acts as a laxative[213]. A decoction of the seeds is used in the treatment of indurations of the liver and spleen. It is also used to treat carcinoma, throat tumours, and imposthumes[269]. A liquid prepared from the seed, when gargled, is said to help tumours of the "sinax." [269]. The seed is eaten as a tonic and appetite stimulant[4, 21, 46, 222]. Hot water poured onto bruised mustard seeds makes a stimulating foot bath and can also be used as an inhaler when it acts to throw off a cold or dispel a headache[4]. Mustard Oil is said to stimulate hair growth. Mustard is also recommended as an aperient ingredient of tea, useful in hiccup. Mustard flour is considered antiseptic[269].

propta Seed - sow in situ from early spring until late summer in order to obtain a succession of crops. The main crop for seed is sown in April.

nwatta An easily grown plant, black mustard is suited to many types of soils except very heavy clays, it grows best on light sandy loams, or deep rich fertile soils[269]. Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Prefers a heavy soil in an open position[16]. Another report says that it prefers a light well-drained soil and some shade in the summer[52]. The plant tolerates an annual precipitation of 30 to 170cm, an annual average temperature range of 6 to 27°C and a pH in the range of 4.9 to 8.2[269]. Black mustard is adapted to a wide variety of climatic conditions, it is often grown in the temperate zone though it is mainly suited to tropical areas, and grown chiefly as a rainfed crop in areas of low or moderate rainfall[269]. Black mustard is often cultivated for its edible seed, though it is going out of favour because it rapidly sheds its seeds once they are ripe and this makes it harder to harvest mechanically than the less pungent brown mustard (*Brassica juncea*). This is used especially as a food flavouring, though it is also sown with the seeds of garden cress (*Lepidium sativum*) to provide mustard and cress, a salading eaten when the seedlings are about one week old. Black mustard is also grown as a medicinal plant. It germinates freely and quickly grows rapidly and makes a very useful green manure. The plants are not very winter hardy so the seed is best sown in the spring when grown for its seed whilst it can be sown as late as late summer as a green manure crop. The flowers have a pleasing perfume, though this is only noticed if several flowers are inhaled at the same time[245].

## 7.2.89 Origanum majorana

Sweet Marjoram

6 tin 9 cyuc 3 kcaak 3 tcan 3 dwat m hkuc hmimhtut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Origanum majorana is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condi-ment TeaLeaves - raw or cooked[2, 52]. Sweet marjoram is widely used as a flavouring for salad dressings, vegetables,

legumes and oils[7, 14, 27, 61, 171, 238]. It has a more delicate flavour than the closely related oregano (*Origanum vulgare*), and is best when used fresh and only added towards the end of cooking[238]. The aromatic seeds are used as a flavouring in sweets, drinks etc[183]. A herb tea is made from the fresh or dried leaves[21, 183]. The flavour resembles a blend of thyme, rosemary and sage[183].

tcanta Disinfectant Dye EssentialThe leaves and flowers yield 0.3 - 0.4% essential oil by steam distillation[240]. Called 'Oil of Sweet Marjoram', it is used as a food flavouring and in perfumery, soaps, hair products etc[57, 61, 171, 238]. The plant is often used to disinfect bee hives[7].

dwatta Antidepressant Antiseptic Antispasmodic Aromatherapy Carminative Chologogue Diaphoretic Disinfectant Emmenagogue Expectorant Stimulant Stomachic TonicSweet marjoram is mainly used as a culinary herb, but is also medicinally valuable due to its stimulant and antispasmodic properties[254]. It is a good general tonic, treating various disorders of the digestive and respiratory systems. It has a stronger affect on the nervous system than the related oregano (*O. vulgare*) and is also thought to lower the sex drive[254]. Because it can promote menstruation, it should not be used medicinally by pregnant women though small quantities used for culinary purposes are safe[254]. The herb is antiseptic, antispasmodic, carminative, chologogue, diaphoretic, diuretic, emmenagogue, expectorant, stimulant, stomachic and mildly tonic[4, 7, 21, 240]. It is taken internally in the treatment of bronchial complaints, tension headaches, insomnia, anxiety, minor digestive upsets and painful menstruation[238]. It should not be prescribed for pregnant women[238]. Externally, it is used to treat muscular pain, bronchial complaints, arthritis, sprains and stiff joints[238]. The plant is harvested as flowering begins and can be used fresh or dried. Marjoram is often used medicinally in the form of the essential oil, about 400 grams being obtained from 70 kilos of the fresh herb[4]. The oil is used as an external application for sprains, bruises etc[4, 240]. The essential oil is used in aromatherapy. Its keyword is 'Muscle relaxant'[210].

propta Seed - sow early spring at 10 - 13°C and only just cover the seed. Germination usually takes place within 2 - 4 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer. The seed can also be sown in situ in April or early May, and, although it can be slow to germinate, usually does well[4]. Division in March or October. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings of young barren shoots in June. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Requires a rather dry, warm, well-drained soil, but is not fussy as to soil type[18], thriving on chalk[1, 37]. Prefers slightly alkaline conditions[200]. Sweet marjoram is often cultivated as a culinary herb, there are some named varieties[46, 183]. Plants do not normally survive the winter outdoors in Britain so they are usually grown as an annual[1, 4, 14, 37]. Another report says that it is possible to overwinter plants in areas with cold winters so long as you apply a thick mulch to the roots[200]. Container growing is preferred in areas with cold, wet winters or humid, wet summers. Plants do not often set seed in Britain[K]. A good companion plant, improving the flavour of nearby plants[14, 18, 20]. The flowers are very attractive to bees[108]. The bruised leaves emit a fragrance somewhat resembling thyme, but somewhat sweeter with balsamic undertones[245]. This is a sacred plant in India[171]. Members of this genus are rarely if ever troubled by browsing deer[233]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

able for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: The leaves and flowers are boiled and eaten[177, 183].

tcanta None known

dwatta None known

propta Pre-soak the seed for 12 hours in warm water and sow February in a warm greenhouse. The germination can be variable. Prick out the seedlings when large enough to handle and overwinter the young plants in a greenhouse for the first winter; planting out in late spring or early summer after the last expected frosts[78]. Cuttings of half-ripe wood, 5 - 8cm with a heel if possible, July/August in well-drained individual pots in a frame. Good percentage[78]. Overwinter the young plants in a greenhouse for the first winter and plant out in late spring or early summer[11]. Root cuttings 3cm long in December. Good percentage[78]. Suckers. Remove them in the dormant season, preferably towards the end of winter, and plant out into their permanent positions.

nwatta Landscape Uses:Border, Container, Massing, Specimen. Requires a light or medium well-drained soil and a sunny position[11, 200]. Succeeds on chalk[11]. Most members of this genus have their top-growth cut back by winter cold in this country. The roots are much hardier, however, and the plants usually resprout freely from the base in late spring, growing away quickly and flowering freely in late summer[K]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200]. Special Features:Not North American native, Attracts butterflies, Attractive flowers or blooms.

## 7.1.18 Anthyllis vulneraria

Kidney Vetch

tf02n 6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli hgatkuyuctup hwicli hyhshrasjlut hpa7tli prkiliwssip hpa7tmwatli xre7t hjonli

drutta Anthyllis vulneraria is a PERENNIAL growing to 0.2 m (0ft 8in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: TeaThe dried flower heads are a tea substitute[9].

tcanta None known

dwatta Antiemetic Antitussive Astringent Laxative VulneraryThe roots leaves and flowers are antitussive, astringent, laxative and vulnerary[7, 9, 13, 21]. This plant is an ancient remedy for skin eruptions, slow-healing wounds, minor wounds, cuts and bruises, it is applied externally[9]. Internally, it is used as a treatment for constipation and as a spring tonic[9]. The plant can be used fresh in the growing season, or harvested when in flower and dried for later use[9].

propta Seed - sow spring or autumn in a cold frame. If there is sufficient seed it can be sown outdoors in situ. Pre-soak the seed for about 12 hrs or scarify the seed[134]. It usually germinates in 1 -2 months at 10°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200].

nwatta Prefers a sunny position[200] and an alkaline soil[7, 13, 17, 21]. Tolerates a pH in the range 4.8 to 8. Prefers a sandy loam[1, 7]. Thrives in poor soils[200]. A rich food source for bees, butterflies and caterpillars[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix

atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 7.1.19 Cercocarpus montanus

Mountain Mahogany, Alderleaf mountain mahogany, Silver mountain mahogany, Island mountain mahogany, tfo2n 6 tin 7 cyuc 0 kcaak 3 tcan 1 dwat m hkuc htut cyutli hgatkuyuctup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cercocarpus montanus is an evergreen Shrub growing to 4 m (13ft 1in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year; in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta None known

tcanta Broom Dye Fuel Hedge WoodBunches of the tied stems have been used as rough brooms[257]. A red to brown dye can be obtained from the root bark[257]. The bark is often mixed with alder and wild plum root barks when making the dye[257]. Tolerant of maritime exposure and amenable to training, this species can be grown as a hedge in seaside gardens[K]. The wood is heavy, hard and brittle[82]. It makes a valuable fuel and is occasionally used in the manufacture of small articles for domestic and industrial use[82].

dwatta Laxative Stomachic TonicAn infusion of the leaves has been used as a general strengthened to the system[257]. The roots and the bark have been used in the treatment of stomach complaints[257]. A cold infusion of the plant or leaves has been used as a laxative[257].

propta Seed - sow autumn or late winter in a cold frame. Seed of the more tender forms is best sown in the late winter whilst harder forms are best sown in the autumn. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame.

nwatta Landscape Uses:Erosion control, Hedge, Screen. Requires a perfectly drained soil in a sunny position[200]. Tolerant of salt spray[200]. Succeeds in a hot dry position. This species has many sub-species. Whilst some forms are hardy to about -17°C when in a suitable soil and position, other forms are frost tender. The hardiest forms, succeeding in zone 5, are *C. montanus argenteus* (Rydb.)F.L.Martin and *C. montanus glaber* (S.Wats.)F.L.Martin. Less hardy are *C. montanus paucidentatus* (S.Wats.)F.L.Martin which succeeds in zone 7, *C. montanus blanchae* (C.Schneid.)F.L.Martin and *C. montanus multiflorus* (Abrams.)F.L.Martin are hardy in zone 8 whilst *C. montanus traskiae* (Eastw.)F.L.Martin. is the least hardy, to zone 9[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212]. Special Features:North American native, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2].

## 7.1.20 Lathyrus sylvestris

Flat pea, Wood pea

tfo2n 6 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Lathyrus sylvestris is a deciduous Perennial Climber growing to 1.5 m (5ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by insects. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It cannot tolerate atmospheric pollution.

kcakta None Known

tcanta Agroforestry Uses: The plant is used as a green manure and soil cover for preventing erosion and for rehabilitating degraded land[1309]. It is grown as an ornamental in gardens, there are some named varieties. Nitrogen Fixer: dwatta None Known

propta Pre-soak the seed for 24 hours in warm water and then sow in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Lathyrus sylvestris is a moderately cold-hardy plant, able to tolerate temperatures down to around -20°C when fully dormant[200]. Grows well in full sun and in light, dappled shade, succeeding in most moderately fertile, well-drained soils[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[1309]. Suggested planting locations and garden types: Forest garden, Flower borders and beds Wall-side Borders Cottage and Informal Garden City and Courtyard Gardens. May be attacked by aphids, slugs and snails.

## 7.1.21 Ulex parviflorus

tfo2n 6 tlin 9 cyuc 0 kcak 0 tcan 0 dwat 1.5 m hkuc

htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ulex parviflorus is an evergreen Shrub growing to 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta None known

tcanta Hedge Hedge ShelterbeltPlants make an impenetrable barrier, especially in exposed maritime areas. They are a useful windbreak by the coast.

dwatta None known

propta Seed - pre-soak 24 hours in hot water and sow in individual pots in a greenhouse in late winter to early spring. Germination should take place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants are very intolerant of root disturbance and so should be planted into their permanent positions as soon as possible, though not until after the last expected frosts[78]. Cuttings of half-ripe wood, 7cm with a heel, July/August in a frame. Pot up in spring as soon as rooting commences and plant out into their permanent positions as soon as possible[78].

nwatta Requires a poor soil and a sunny position, doing well on dry sunny banks or poor gravelly soils[11]. Succeeds on land that is too dry and barren for most plants[200]. Intolerant of shade, nor does it do well on rich soils[11, 182]. Prefers a neutral to slightly acid soil[200], disliking alkaline soils[17]. Plants are very intolerant of root disturbance[11]. Very tolerant of maritime exposure and, once established, drought[75, 186]. Hardy to about -15°C[200]. Hybridizes

freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

## 7.1.22 Clitoria mariana

Atlantic Pigeonwings, Butterfly Pea

tfo2n 6 tlin 9 cyuc 0 kcak 3 tcan 0 dwat m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli prik hpa7tmwatli hjonli

drutta Clitoria mariana is a PERENNIAL CLIMBER growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None Known

tcanta Nitrogen fixer.

dwatta AphrodisiacThe roots and seeds have been used medicinally, including as an aphrodisiac according to the ancient but unscientific doctrine of signatures.’ but we have not been able to confirm this - Missouriplants.com

propta Seed

nwatta A temperate perennial forb. Stems are erect to reclining or trailing, to 1.2m, glabrous to sparsely pubescent with short, fine, curved hairs. It is a twining vine and not a climbing vine so is often found growing along the ground. In southern China it grows in forests between 100-2,000m above sea level. It grows in hardiness zones 6-9. Light Requirement: Sun, Part Shade. Preferred soil: Dry and Sandy. Bloom Color: Pink , Blue. Bloom Time: Jun to Aug. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Herbaceous. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 7.1.23 Colutea istria

Bladder-senna

tfo2n 6 tlin 9 cyuc 0 kcak 0 tcan 0 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Colutea istria is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta Hedge Hedge Soil reclamationUsed in land reclamation projects in the Negev desert, consolidating soil and plant debris from flood waters[200]. Plants can be grown as a hedge[200].

dwatta None known

propta Seed - pre-soak for 24 hours in hot water and sow late winter in a greenhouse[113]. Scarification can help speed up the germination process[164]. Germination can be slow and erratic[200], though treated seed usually germinates in 1 - 3 months at 20°C[164]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[78]. Cuttings are not very long-lived[78].

nwatta Requires a well-drained soil in full sun[200]. Grows well on dry sunny banks and in poor soils[1, 182]. Dislikes strong winds, though another entry in the same book

drutta Tritelleia laxa is a BULB growing to 0.5 m (1ft 8in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[105, 177, 257]. Tasty[161]. A sweet flavour[207]. Rich in starch, the bulb can be used like potatoes[257].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Alternatively, the seed can be sown in spring in a cold frame. Germination usually takes place within 1 - 3 months at 15°C. Sow the seed thinly so that there is no need to prick them out and grow the seedlings on in the pot for their first year. Give an occasional liquid feed to ensure that they do not become mineral deficient. Seedlings are prone to damping off so be careful not to overwater them and keep them well ventilated. When they become dormant, pot up the small bulbs placing about 3 in each pot. Grow them on in the greenhouse for another year or two until the bulbs are about 20mm in diameter and then plant them out into their permanent positions when they are dormant in the autumn. Division of flowering size bulbs in autumn. Dig up the clumps of bulbs, replanting the larger ones direct into their permanent positions. It is best to pot up the smaller ones and grow them on in a greenhouse for a year before planting them out when they are dormant in early autumn.

nwatta Succeeds outdoors in a warm position[90], requiring a rich well-drained sandy loam[1]. Likes plenty of moisture whilst in growth followed by a warm dry period in late summer and autumn[200]. A polymorphic species[71].

## 7.2.87 Brassica juncea napiformis

Root Mustard

6 tlin 9 cyuc 4 kcak 0 tcan 2 dwat 0.8 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica juncea napiformis is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil RootEdible Uses: Condiment OilLeaves - raw or cooked[206]. A peppery flavour that can range from mild to hot, they make a good cooked vegetable[206]. The leaves can also be finely shredded and added to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of 'brown mustard'[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads. Root - raw or cooked[183]. Usually sliced and made into pickles[206].

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This

is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactagogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sow in situ from June to October. Spring-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* that has been selected in the Orient for its edible root[206]. It is fairly hardy, surviving temperatures down to at least -4°C[269]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.88 Brassica nigra

Black Mustard

6 tlin 9 cyuc 3 kcak 2 tcan 3 dwat 1.2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica nigra is a ANNUAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Leaves Oil Oil Seed StemEdible Uses: Oil OilLeaves - raw or cooked[2, 85, 100]. A hot flavour; they can be finely chopped and added to salads or cooked as a potherb[183]. The seedlings can also be used as a salading when about one week old, adding a hot pungency to a salad[2, 27, 183, K]. Immature flowering stems - cooked and eaten like broccoli[183]. Mustard seed is commonly ground into a powder and used as a food flavouring and relish[4, 5, 17, 27, 34]. This is the black mustard of commerce, it is widely used as a food relish and as an ingredient of curry[183]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. The seed can also be used whole to season pickles, curries, sauerkraut etc[183, 238]. Black mustard has a stronger more pungent flavour than white mustard (*Sinapis alba*) and brown mustard (*B. juncea*) [238]. An edible oil is obtained from the seed[2, 21, 171].

tcanta Green manure Oil Oil RepellentA semi-drying oil is obtained from the seed, as well as being edible it is also used as a lubricant, illuminant and in making soap[17, 21, 46, 100]. The plant is often grown as a green manure, it is very fast, producing a bulk suitable for digging into the soil in about 8 weeks[100]. Not very winter hardy, it is generally used in spring and summer. It does harbour the pests and diseases of the cabbage family so is probably best avoided where these plants are grown in a short rotation and especially if club root is a problem. Mustard oil (allyl isothio-

can turn bitter especially in the summer and if the plant is growing in a hot dry position[K]. Although individual leaves are fairly small, they are produced in abundance and are easily picked[K]. Stalks and flowers - raw[52]. A nice addition to the salad bowl[K]. Bulb - raw[5, 53, 62]. Although very small and labour-intensive to harvest, the boiled and peeled root has the flavour of chestnuts[244]. Another report says that the plant has a fibrous root system[62] so this report seems to be erroneous[K].

tcanta Although only an annual, this species makes an excellent ground cover in a cool acid soil under trees. In such a position it usually self-sows freely[208] and grows all year round[K].

dwatta Antirheumatic Laxative Vitamin CThe leaves are gently laxative[94]. Apart from its value as a nourishing vegetable that is rich in vitamin C, it can also be taken as an invigorating spring tonic and an effective diuretic[254]. A poultice of the mashed plants has been applied to rheumatic joints[257].

propta Seed - sow spring or autumn in situ. The seed usually germinates rapidly.

nwatta Prefers a moist peaty soil[1, 60]. It is often found growing wild on sandy soils[264]. An easily grown plant, it can succeed on very poor and dry soils[52, 60]. Plants grow well the dappled shade of trees, producing a better quality crop in such a situation[52, 60, 264]. Although only an annual[208], it usually self-sows when well sited. A very hardy plant, tolerating temperatures down to at least -15°C. Miner's lettuce is occasionally cultivated as a salad plant[1, 46]. It's main value is as a reliable producer of leaves in the winter, though it can provide leaves all year round[141, 200, 264]. It can be grown as a cut and come again crop[183]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A self-seeding annual [1-2]. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2]. The root pattern is fibrous dividing into a large number of fine roots [1-2].

### 7.2.85 Elymus hispidus

Wild triga, Pubescent wheatgrass, 6 tlin 9 cyuc 4 kcak 4 tcan 0 dwat 0.8 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwshom hpa7tmwatli fyif hjonli

drutta Elymus hispidus is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. The flowers are pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Edible Portion: Seeds, Grain, Cereal. Seed - raw or cooked[646 ]. A sweet, mild, nutty flavout[646 ]. Usually ground into a powder and used as a flour, it can also be eaten raw when sprouted or can be cooked whole in a similar manner to rice, or be added to steaks etc[646 , K ]. The grain has higher levels of protein (20.8%), fat (3.21%) and ash (2.64%) than wheat[646 ]. The protein is nutritionally limiting in lysine as is wheat, but the grain has higher levels than wheat of all the other essential amino acids[646 ]. No functional gluten was found in samples of the grain tested by USDA. However no tests have been conducted to determine if individuals with wheat or gluten allergies can tolerate this grain and, since it is closely related to wheat, there is a possibility that this may cause similar problems[646 ]. Most of the grain will have the hulls still attached after harvesting. Dehulling can be accomplished with any piece of equipment that will rub the grain vigorously. A brush machine in which brushes rotate rapidly inside a cylindrical screen is an effective dehuller[646 ]. Carbon Farming Solutions - Staple Crop: balanced carb (The term staple crop typically refers to a food that is eaten routinely and accounts for a dominant part of people's diets in a particular region of the world) [1-1].

tcanta Widely planted and naturalized in western North America, used for forage and erosion control. An excellent food source for grazing and browsing animals. Left unharvested, the vegetation is a good nesting habitat for some

birds and waterfowl. Generally, it is not an invasive plant and coexists well with native plant species. Erosion control and land rehabilitation are additional uses for this plant. This species is well adapted to the stabilization of disturbed soils. It can be used in critical and urban areas where irrigation water is limited; and to stabilize ditchbanks, dykes, roadsides and airport landing strips[277 , 646 ]. The plant can also be use to build soils because of its heavy root production. Levels as high as 7,500 kilos (dry weight) per hectare of root production in the upper 20cm of soil have been measured in five-year-old stands[277 ]. It can be used as a reclamation grass for mine sites[646 ]. It establishes quickly to form a protective mat of roots and rhizomes, even when planted on soils degraded by earth moving or mining. Within five years, stands have produced up to 7000 pounds of the dry root mass per acre in the top 8 inches of soil. Heavy root production holds the soil in place and restores its natural fertility by increasing the soil carbon. Attractive to pets who often chew on it to aid their digestion.

dwatta None Known

propta Seed - if sufficient moisture is available, the seed can be sown shallowly in situ in late summer. It germinates within a few days and grows rapidly before becoming dormant for the winter. New growth in spring is rapid, the plant flowering in early summer and maturing the seed in mid to late summer[646 ]. In drier soils the seed is better sown in the spring, but will generally only give a light crop or no crop of seed in its first year[277 ]. If seed is in short supply then it can be sown in containers in a greenhouse, pricked out into individual pots when large enough to handle and then planted out when 15cm or more tall. Division of the rhizomes is easy.

nwatta Management: Standard Staple Crop: Balanced carb Under DevelopmentClimate: cold to warm temperate. Humidity: semi-arid to humid. When grown at higher elevations (from 1,000 - 2,700 metres) Thinopyrum intermedium can tolerate a minimum annual rainfall of around 300mm, though rainfall requirements are greater at lower elevations[277 ]. The plant can tolerate up to 1,160mm per annum[418 ]. Plants can withstand considerable cold, with temperatures down to around -25°C, so long as this is not accompanied by heavy rain[277, 418 ]. Requires a sunny position. It prefers well-drained loamy to clayey textured soils; the pubescent form performs best on loamy to sandy to shallow soils[277 ]. It can tolerate slightly acidic to mildly saline conditions[277 ]. Plants, especially the pubescent form, can tolerate low fertility[277 ]. Plants are tolerant of moderate, short-lasting seasonal inundation of the soil in spring[277 ]. Plants are very tolerant of fire - top growth is killed but the plant usually resprouts freely from the roots[277 ]. Seed production when the plant has ample moisture in the growing season can reach 500 - 600 kilos per hectare in the first year of harvest, though this diminishes in subsequent years unless the plant is fertilized and preferably also divided[277, 646 ]. During the seed conditioning process, some of the seeds lose their hulls, producing naked hull-less grain. The hull-less seeds tend to lose viability more quickly and are therefore not sold for planting hay and forage crops. This grain is now being sold as Wild Triga, the first commercially available perennial grain[646 ]. There are two main forms of this species and at one time the two were treated as distinct (as Agropyron intermedium (Host) P.Beauv., with leaves and flower spikes mainly smooth; and Agropyron trichophorum (Link) K.Richt., which is densely hairy). The two interbreed freely and the commercial seed will often produce a mix of the two forms. The hairy form is considered to be slightly more drought tolerant and winter hardy[277].

Carbon Farming Solutions - Cultivation: under development. Researchers estimate that Elymus hispidus could be yielding as well as wheat within 20 years. However, seed size will be smaller. Gluten quality is not as good as wheat. Management: standard (Describes the non-destructive management systems that are used in cultivation) [1-1].

#### 7.2.86 Tritileia laxa

Grassnut, Ithuriel's spear

6 tlin 9 cyuc 4 kcak 0 tcan 0 dwat 0.5 m hkuc htut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

says that it tolerates salt-laden winds[200]. This species is not very hardy in Britain, tolerating temperatures down to about -5°C[200], but it should succeed outdoors in the milder areas of the country[182]. Even there it is probably best grown on a south or south-west facing wall[200]. According to the International Legume Database, this species may actually be *Colutea abyssinica* Kunth and Bouch., a species found in N. Africa where it grows in montane grassland and shrubland. Flowers are produced on the current year's growth[200]. Plants in this genus are notably resistant to honey fungus[200]. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

#### 7.1.24 Ceanothus prostratus

Squaw Carpet, Prostrate ceanothus

to2n 6 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli kyucctup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Ceanothus prostratus is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It can fix Nitrogen. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known

tcanta Dye SoapaA green dye is obtained from the flowers[168]. All parts of the plant are rich in saponins - when crushed and mixed with water they produce a good lather which is an effective and gentle soap[168, 169]. This soap is very good at removing dirt, though it does not remove oils very well. This means that when used on the skin it will not remove the natural body oils, but nor will it remove engine oil etc[K] The flowers are a very good source, when used as a body soap they leave behind a pleasant perfume on the skin[K]. The developing seed cases are also a very good source of saponins[K]. A useful ground cover plant, especially on warm sunny slopes[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed should be pre-soaked for 12 hours in warm water and then given 1 - 3 months stratification at 1°C[138, 200]. Germination usually takes place within 1 - 2 months at 20°C[138]. one report says that the seed is best given boiling water treatment, or heated in 4 times its volume of sand at 90 - 120°C for 4 - 5 minutes and then soaked in warm water for 12 hours before sowing it[214]. It then requires a period of chilling below 5°C for up to 84 days before it will germinate[214]. The seed exhibits considerable longevity, when stored for 15 years in an air-tight dry container at 1 - 5°C it has shown little deterioration in viability[214]. The seed is ejected from its capsule with some force when fully ripe, timing the collection of seed can be difficult because unless collected just prior to dehiscence the seed is difficult to extract and rarely germinates satisfactorily[214]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in late spring or early summer. Cuttings of half-ripe wood, taken at a node[200], July/August in a frame[11]. Cuttings of mature wood of the current year's growth, 7 - 12 cm with a heel, October in a cold frame[78]. The roots are quite brittle and it is best to pot up the callused cuttings in spring, just before the roots break[78]. Good percentage.

nwatta Prefers a warm sunny position but tolerates light shade[11, 200]. Tolerates some lime, but will not succeed on shallow chalk[200]. A difficult plant to cultivate, it might do well in a lime-free soil in full sun and occasionally does well on heavier soils[208]. This species is particularly susceptible to damage by frost when it is young[200], though it should be hardy as it grows older[11]. The sub-species *C. prostratus* *occidentalis*. McMinn. is a form growing by the coast in N. California - it may be a more suitable form for maritime areas[K]. Plants dislike root disturbance, they

should be planted out to their permanent positions whilst still small[182]. Dislikes heavy pruning, it is best not to cut out any wood thicker than a pencil[182]. Plants flower on the previous year's growth, if any pruning is necessary it is best carried out immediately after the plant has finished flowering[200]. Constant pruning to keep a plant small can shorten its life[200, 219]. Fast growing, it flowers well when young, often in its second year from seed[11]. The branches are prostrate and often form roots where they touch the soil[11]. Hybridizes freely with other members of this genus[200]. Some members of this genus have a symbiotic relationship with certain soil micro-organisms, these form nodules on the roots of the plants and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200, 212]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

#### 7.1.25 Genista pilosa procumbens

Creeping broom, Creeping hairy broom

to2n 6 tlin 8 cyuc 0 kcak 3 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli hgtakyuactup hwicli hyishrasjlut hpa7tli flatprikliwsslip hpa7tmwatli hjonli

drutta Genista pilosa procumbens is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It can fix Nitrogen. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta None Known

tcanta A good high density groundcover. Nitrogen Fixer. Location: Border, Ground Cover, Mass Planting, Rock Garden, Wildlife Garden, Woodland Garden. Invertebrates shelter: beneficial for insects and other arthropods. Nectary: provides nectar or pollen for beneficial insects [1-2].

dwatta None known

propta Seed: Easy. Cover seed and germinate at 55-65F/13-18C. Chipping and soaking may aid germination. Do not/transplant. Cuttings taken in summer, or by simple layering. Tip cuttings about 3-6 cm may be taken in mid-summer and rooted in a mist chamber or shaded frame.

nwatta Evergreen prostrate shrub. Flowers, golden-yellow, cover the plants in late spring to early summer. Poor, dry, sandy, and stony soils. Full sun or part shade and well drained soil. Soil pH: Acid/Neutral/Alkaline. Foot Traffic: Light. Drought tolerant. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2].

## 7.2 mran

### 7.2.1 Quercus ilex ballota

Holm Oak

6 tin 9 cyuc 5 kcak 3 tcan 2 dwat 25 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliws hpa7tmwatli hjonli

drutta Quercus ilex ballota is an evergreen Tree growing to 25 m (82ft) by 20 m (65ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade

(light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: Coffee OilSeed - raw or cooked[1, 2, 46, 63, 200]. The seed of this variety is normally sweet. The seed is up to 3cm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed from some trees contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute. An edible oil is obtained from the seed[183].

tcanta Fuel Hedge Hedge Oil Repellent Shelterbelt Tannin WoodA much of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Very tolerant of maritime exposure and of trimming, it can be grown as a shelterbelt tree or hedge in maritime areas[11, 29, 49, 75]. Wood - strong, hard, durable. Used for furniture[46, 61, 89]. It makes a good charcoal[89] and a good fuel, burning well even if green[146]. The bark is a source of tannin[146].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but its best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Thrives on shallow chalky soils[188]. Succeeds in all soils except those that are cold and poorly drained[98]. Grows well in sandy soils[188]. Young plants tolerate reasonable levels of side shade[200]. Very resistant to maritime exposure[11, 49, 75]. A very ornamental[1] though quite slow-growing tree[75]. Transplants badly unless moved regularly and this should be done as growth commences in late May or in September[11]. This plant is treated as a distinct species, *Q. rotundifolia*. Lam. by some botanists[50]. Cultivated for its edible seed in Spain[11, 63]. The tree grows well in Britain but is said to fruit poorly here[11], however a tree at Kew was bearing a very good crop at the end of the hot summer of 1989 and again in 1991[K]. The seed ripens in its first year[200]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200].

## 7.2.2 Torreya nucifera

Kaya, Japanese torreya

6 tlin 8 cyuc 5 kcak 0 tcan 2 dwat 20 m hkuc pcmhmimt cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta Torreya nucifera is an evergreen Tree growing to 20 m (65ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen from September to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw, cooked or used in confectionery[1, 63, 105, 183]. An agreeable sweet slightly resinous flavour[11]. An aromatic flavour[46], it is much relished and is eaten in quantity[178] though it is said to be laxative if eaten in excess[2]. An edible oil is obtained from the seed[1, 2, 1, 63, 178, 183]. Used in cooking[183].

tcanta OilNone known

dwatta Anodyne Anthelmintic Carminative Digestive Laxative PectoralThe seeds are anthelmintic[63, 147, 178, 218]. They are used in the treatment of several parasitic conditions including hookworm, tapeworms, pinworms and roundworms[279]. The plant is anodyne, carminative, digestive, laxative and pectoral[63, 147, 178, 218].

propta Seed - best sown as soon as it is ripe in a cold frame. Some of the seed should germinate in the following spring though much of it might take another 12 months. Stored seed requires a period of cold stratification and can take 18 months or more to germinate. Prick out the seedlings into individual pots as soon as growth is observed and grow them on in light shade in the greenhouse for at least the next couple of winters, making sure to pot them on into larger pots as and when required. Plant them out into their permanent positions in early summer when the plants are at least 20cm tall. Cuttings of half-ripe shoots in late summer[1]. Cuttings do not grow well[11]. Layering.

nwatta Management: Standard Regional Crop Staple Crop: Protein-oilSucceeds in ordinary garden soil, tolerating some lime[1]. Prefers an acid soil[200]. Dislikes wind exposure[200]. Requires a sheltered position and either high humidity or a moist riverside soil[200]. Tolerates woodland shade very well[200]. Requires hot, very humid summers for best growth[200]. Trees are probably not hardy in all parts of Britain, but should succeed quite far north. A tree at Wakehurst Place was 11 metres tall in 1970[185]. A shrub growing in the shade of coniferous trees at Kew was about 2.5 metres tall and 4 metres wide in September 1993[K], it was carrying a very heavy crop of fruit[K]. No fruit was formed in 1994[K]. A specimen at Cambridge Botanical Gardens was 6 metres tall and 6 metres wide, it was carrying an enormous crop of seed in the late summer of 1996[K]. This plant has an excellent potential as a nut crop in Britain[K]. Sometimes cultivated for its edible seed in Japan, the variety ‘Shibunashigaya’ is considered to be the best for seed production[46]. The seed takes two summers to mature[229]. Plants are dioecious so both male and female plants are required if seed is to be produced. Occasional trees are monoecious with dioecious branches. Solitary trees have been seen on a number of occasions with heavy crops of fertile seed, so it would appear that the tree is not dioecious[K].

## 7.2.3 Vitis vinifera

Grape, Wine grape, Purpleleaf Grape, Common Grape

6 tlin 10 cyuc 5 kcak 2 tcan 2 dwat 15 m hkuc hmimhut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Vitis vinifera is a deciduous Climber growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Fruit Leaves Oil ShootsI Uses: OilFruit - raw or dried for winter use[1, 2, 11, 46]. The dried fruits are the raisins, sultanas and currants of commerce, different varieties producing the different types of dried fruit. A fully ripened fresh fruit is sweet, juicy and delicious[K]. The fruit juice can be concentrated and used as a sweetener[183]. This fruit is widely used in making wine[183]. Leaves - cooked[55]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour[183]. Young tendrils - raw or cooked[85]. The flower clusters are used as a vegetable[183]. An edible oil similar to

this is probably the wild species that *P. ixocarpa* was derived from in cultivation[170].

### 7.2.82 Brassica juncea foliosa

Leaf Mustard

6 tlin 9 cyuc 4 kcak 0 tcan 2 dwat 0.3 m hkuc hmimhut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica juncea foliosa is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves OilEdible Uses: Condiment OilLeaves - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The leaves can also be finely shredded and added to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of ‘brown mustard’[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads.

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactogogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sown in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* with entire leaves that has been selected in the Orient for its edibility. There are many named varieties[206]. A very fast growing variety, usually maturing within 40 days of sowing[206]. The plants in this group are fairly cold-tolerant[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.83 Brassica napus napobrassica

Swede

6 tlin 9 cyuc 4 kcak 0 tcan 2 dwat 0.8 m hkuc hmimhut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica napus napobrassica is a BIENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked as a potherb[183]. A mild, cabbage-like flavour[K]. Root - raw or cooked[1, 16, 46, 171, 183]. A richer flavour than turnips, it makes a good cooked vegetable and, when finely grated, is acceptable in mixed salads[183, K]. The root can be 30cm or more in diameter, though it is usually eaten smaller since it then is more tender[K]. It is available from early autumn, and can either be left in the ground over winter to be harvested as required, or can be harvested and stored in a cool, frost-free place where it will keep for 6 months[K].

tcanta The seed contains up to 45% of an edible semi-drying oil, it is used as a luminaant, lubricant, in soap making etc[13, 21, 57, 142].

dwatta Diuretic EmollientThe root is emollient and diuretic[240]. The juice of the roots is used in the treatment of chronic coughs and bronchial catarrh[240, 269]. The seed, powdered, with salt is said to be a folk remedy for cancer[269]. Rape oil is used in massage and oil baths, it is believed to strengthen the skin and keep it cool and healthy. With camphor it is applied as a remedy for rheumatism and stiff joints[269].

propta Seed - sow April to June in situ.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[16, 200]. Prefers a stiff moist soil and a fairly high rainfall[16, 20, 26]. Another report says that it prefers a light but rich soil and an open sunny position[264]. Succeeds in any reasonable soil[52]. Sunny days and cool nights are favourable for plant growth whilst dry weather at harvest time is essential[269]. Swede is reported to tolerate an annual precipitation of 30 to 280cm, an annual average temperature range of 5 to 27°C and a pH in the range of 4.2 to 8.2[269]. Very young plants are susceptible to cold damage, -4°C either killing or injuring seedlings, whereas -2°C has no affect when the plants are more than one month old[269]. The garden swede is often cultivated for its edible root, there are several named varieties[183]. The plant is somewhat hardier than turnips and in most parts f Britain it can usually be left outdoors all winter and harvested as required. Plants take 4 - 6 weeks longer to mature than turnips[183]. Swede is 70% self-pollinating and 30% cross-pollinated. Even if wind and insects are absent, seed are still produced. Yield increases with honeybees[269]. A good companion plant for peas but it dislikes growing with hedge mustard and knotweed[18].

## 7.2.84 Claytonia perfoliata

Miner’s Lettuce

6 tlin 10 cyuc 4 kcak 2 tcan 1 dwat 0.2 m hkuc pcmhmimhut cyutli kyuctup hwicli hvishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Claytonia perfoliata is a ANNUAL growing to 0.2 m (0ft 8in). It is not frost tender. It is in leaf all year, in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Leaves - raw or cooked[2, 5, 12, 27, 52, 62]. A fairly bland flavour with a mucilaginous texture, it is quite nice in a salad[183, K]. The young leaves are best[85], older leaves



propta Seed - sow in situ from early spring to early autumn in order to obtain a succession of edible leaves. Most varieties of Oriental vegetables belonging to this species are best sown from late June to early September otherwise they may bolt[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. Tolerates a pH in the range 4.3 to 8.3. Brown mustards is widely cultivated for its edible seed which is used to make the condiment 'brown mustard' and is also sprouted as the mustard of mustard and cress[50, 200]. It has only 70% of the pungency of black mustard (*B. nigra*) but can be harvested mechanically so is more viable commercially[238]. This species has also been cultivated in the Orient for many hundreds of years and a wide diversity of forms has been developed with edible leaves, stems, roots and seeds. These forms have been classified by the botanists as follows and separate entries have been made for each of them. *B. juncea crispifolia*. The curled or cutleaf mustards, this group has attractively curled edible leaves. *B. juncea foliosa*. The leaf mustards have quite large smooth-edged edible leaves. *B. juncea japonica*. Rather similar to *B. juncea crispifolia* and combined with that group by some botanists. *B. juncea multiceps*. The multishoot mustard group. *B. juncea napiformis*. A form with a swollen edible root. *B. juncea rugosa*. Large somewhat cabbage-like edible leaves. *B. juncea strumata*. A form with large edible leaf stalks. *B. juncea tumida*. A form with swollen edible stems. Plants take from 2 - 5 months from sowing to maturity, depending on the season and the cultivar[206]. They prefer a fairly high stable temperature and are well adapted to short day length[200]. Many are best grown in warmer climates than Britain but there are several cultivars that grow well in this country[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.80 Brassica juncea rugosa

Head Mustard

6 tin 9 cyuc 4 kcak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Brassica juncea rugosa is a ANNUAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Seed ShootsEdible Uses: Condiment OilLeaves and stems - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The leaves are more peppery than the stems[206]. The leaves can also be finely shredded and added to mixed salads[206]. The leaves can be harvested at any stage from seedling to maturity, becoming hotter with age[206].The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of 'brown mustard' [183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to

destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads.

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactagogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder inflammation or haemorrhage[269].

propta Seed - sow in situ from August to October[206]. Seed can also be sown in the spring but plants are very likely to run to seed[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* that has been selected in the Orient for its large edible leaves, there are many named varieties[206]. Plants are very hardy and stand the winter well in temperate areas, they can be harvested lightly in the winter but the main cropping time is in spring[206]. Plants take 3 - 4 months to reach maturity[206]. They prefer a fairly high stable temperature and are well adapted to short day length[200]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.81 Physalis philadelphica

Wild Tomatillo, Mexican groundcherry

6 tin 9 cyuc 4 kcak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Physalis philadelphica is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 50, 105]. A delicious flavouring when used like a tomato and added to soups, stews etc[K]. The plant conveniently wraps up each fruit in its own 'paper bag' (botanically, the calyx) to protect it from pests and the elements. This calyx is toxic and should not be eaten. The fruit can be stored for up to a year if picked before they are fully ripe and left inside their calyx. tcanta None known dwatta OphthalmicThe juice from the berries has been used as an eyewash[257].

propta Seed - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out after the last expected frosts. Consider giving them some protection such as a cloche until they are growing away well. Diurnal temperature fluctuations assist germination[170].

nwatta Succeeds in any well-drained soil in full sun or light shade[200]. Cultivated for its edible fruit in the Ukraine[50]. There are some named varieties[183, 200]. 'Purple de Milpa' has small purple-tinged fruits with a sharp flavour, they keep well[200]. Closely related to *P. ixocarpa*,

sunflower oil is obtained from the seed[7, 183]. It needs to be refined before it can be eaten[46]. A polyunsaturated oil, it is suitable for mayonnaise and cooking, especially frying[238]. Sap - raw. Used as a drink, it has a sweet taste. The sap can be harvested in spring and early summer, though it should not be taken in quantity or it will weaken the plant. The roasted seed is a coffee substitute[7]. Cream of tartar, also known as potassium bitartrate, a crystalline salt, is extracted from the residue of pressed grapes, and from the sediment of wine barrels. It is used in making baking powder[238].

tcanta Dye Miscellany OilA yellow dye is obtained from the fresh or dried leaves[168]. An oil from the seed is used for lighting and as an ingredient in soaps, paints etc[46, 61]. Cream of tartar, extracted from the residue of pressed grapes, is used in making fluxes for soldering[238]. Especially when growing in hotter countries than Britain, the stems of very old vines attain a good size and have been used to supply a very durable timber[4].

dwatta Analgesic Antiinflammatory Astringent Bach Cholera Demulcent Diuretic Hepatic Laxative Lithotropic Miscellany Skin StomachicGrapes are a nourishing and slightly laxative fruit that can support the body through illness, especially of the gastro-intestinal tract and liver[254]. Because the nutrient content of grapes is close to that of blood plasma, grape fasts are recommended for detoxification[254]. Analgesic[178]. The fresh fruit is antilithic, constructive, cooling, diuretic and strengthening[4, 218]. A period of time on a diet based entirely on the fruit is especially recommended in the treatment of torpid liver or sluggish biliary function[7]. The fruit is also helpful in the treatment of varicose veins, haemorrhoids and capillary fragility[254]. The dried fruit is demulcent, cooling, mildly expectorant, laxative and stomachic[218]. It has a slight effect in easing coughs[254]. The leaves, especially red leaves, are anti-inflammatory and astringent[4, 7, 218, 254]. A decoction is used in the treatment of threatened abortion, internal and external bleeding, cholera, dropsy, diarrhoea and nausea[4, 218, 254]. It is also used as a wash for mouth ulcers and as douche for treating vaginal discharge[254]. Red grape leaves are also helpful in the treatment of varicose veins, haemorrhoids and capillary fragility[254]. The leaves are harvested in early summer and used fresh or dried[238]. The seed is anti-inflammatory and astringent[4, 7, 218]. The sap of young branches is diuretic[7]. It is used as a remedy for skin diseases[218, 240] and is also an excellent lotion for the eyes[4, 7, 254]. The tendrils are astringent and a decoction is used in the treatment of diarrhoea[7]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Dominating', 'Inflexible' and 'Ambitious'[209].

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Landscape Uses:Arbor. Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil, but dislikes excessively chalky soils[200]. Prefers a pH in the range 6.5 to 7[200] but tolerates a range from 4.3 to 8.6. Succeeds in sun or partial shade though a warm sunny sheltered position is required for the fruit to ripen[200]. Very commonly grown in the temperate zones of the world for its edible fruit, there are many named varieties, some of which have been developed for their use as a dried fruit, others for dessert use and others for wine[132, 183]. Good and regular crops are a bit problematical in Britain, grapes are on the northern most limits of their range in this country and the British summer often does not provide enough heat to properly ripen the fruit. Late frosts can also damage young growth in spring, though dormant shoots are very hardy, tolerating temperatures down to about -20°c[11].

Nonetheless, there are a number of commercial vineyards in Britain (usually producing wine grapes) and, given a suitably sunny and sheltered position, good dessert grapes can also be grown. In general it is best to grow the dessert varieties against the shelter of a south or west facing wall[219]. There are a number of varieties that have been bred to cope with cooler summers. Grapes are very susceptible to attacks by phylloxera, this disease is especially prevalent in some areas of Europe and it almost destroyed the grape industry. However, American species of grapes that are resistant to phylloxera are now used as rootstocks and this allows grapes to be grown in areas where the disease is common. Britain is free of the disease at the present (1989) and grapes are usually grown on their own roots. Plants in this genus are notably susceptible to honey fungus[200]. The flowers are intensely fragrant[245]. Grapes grow well in the company of hyssop, chives, basil and charlock[201]. They grow badly with radishes, both the grapes and the radishes developing an off taste[201]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182]. The cultivated grape is thought to have been derived from *V. vinifera sylvestris*. (Gmel.)Hegi. This form has dioecious flowers and produces small black grapes. Special Features:Attractive foliage, Inconspicuous flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

## 7.2.4 Sorbus domestica

Service Tree

6 tin 10 cyuc 5 kcak 2 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sorbus domestica is a deciduous Tree growing to 15 m (49ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is usually bletted if it is going to be eaten raw[1, 2, 3, 11, 115, 183]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit[K]. The fruit will often begin its bletting process whilst still on the tree and we have eaten delicious fruits straight from the tree in mid-September[K]. The fruit can also be dried and used like prunes. The fruit is up to 3cm across[200].

tcanta Tannin WoodThe bark is a source of tannin[61]. Wood - fine grained, very heavy, hard to split. Used for furniture, screws, wine presses etc[11, 46, 61, 74, 115].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. The service tree is occasionally cultivated for its edible fruit[3, 45, 132]. There are 2 distinct forms, *S. domestica pomifera*. (Hayne.)Rehd. with apple shaped fruits (which ripen from September) and *S. domestica pyriformis*. (Hayne.)Rehd. with pear shaped fruits

which ripen from October[11, 132]. Plants are susceptible to fireblight[188] and to canker (which is especially prevalent in areas with high rainfall)[K]. They grow best in the drier areas of Britain, which in general means the eastern half of the country[121]. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 7.2.5 Crataegus tanacetifolia

Tansy-Leaved Thorn

6 tlin 8 cyuc 5 kcaak 3 tcan 2 dwat 10 m hkuc hmimhtut cyutli hgtatkyuctcuphja7n hwicli hrasljutnyikfrjp hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Crataegus tanacetifolia is a deciduous Tree growing to 10 m (32ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 3, 105]. A good size with a soft juicy texture and an acid/sweet apple-like flavour that is very nice raw when fully ripe[11, 183, K]. The fruit can also be used in making pies, preserves, etc, and can be dried for later use. The fruit is up to 25mm in diameter[200]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta WoodWood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[74, 82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to

pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. Unlike most members of this genus, the flowers are sweetly scented and free from the smell of decaying fish[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. This species has an excellent potential as a fruit crop in Britain. The fruit is of a reasonable size, it is usually very freely borne and the quality is very acceptable for dessert[K]. The tree is very easily grown and is little troubled by pests or diseases. It also requires very little attention, once the trees are established virtually the only work needed is to harvest the fruit each year[K]. A tree at Cambridge Botanical Gardens was about 6 metres tall and 4 metres wide in September 1993. It usually carries a very good crop of fruit[K]. A very ornamental plant[1], it is closely related to *C. laciniata*[11].

## 7.2.6 Actinidia deliciosa

Kiwi Fruit

6 tlin 9 cyuc 5 kcaak 1 tcan 1 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flat hpa7tmwatli nyanhjen hjonli

drutta Actinidia deliciosa is a deciduous Climber growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Leaves SeedEdible Uses: Fruit - raw or cooked. A delicious flavour[1, 2, 3, 11, 105], the fruit can be up to 8cm long, it is very juicy when fully ripe and has a refreshing, acid flavour[K]. It contains a number of small seeds, but these are easily eaten with the fruit[K]. Rich in vitamin C[183]. Fresh fruits contain 100 - 420mg vitamin C per 100g and 8 - 14% carbohydrate[218]. Acidity is 1 - 2%, mainly citric acid[218]. The fruit ripens in November and can store for 3 - 4 months[132]. Yields of 8 - 30 tonnes per hectare are possible[218]. Leaves are a famine food[179].

tcanta Paper PencilPaper is made from the bark[178]. If the bark is removed in one piece from near the root and placed in hot ashes, it becomes very hard and can be used as a tube for a pencil[178].

dwatta Diuretic Febrifuge Sedative Urinary Vitamin CThe fruits, stems and roots are diuretic, febrifuge and sedative[147]. They are used in the treatment of stones in the urinary tract, rheumatoid arthralgia, cancers of the liver and oesophagus[147].

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°C, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade

rant[176]. It is used in the treatment of stiffness sensation and pain in the chest, angina pectoris, pleurisy, bronchitis, diarrhoea and tenesmus in cases of dysentery[176]. Although no other specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. Tolerates poor soils[206]. Plants often die-back in hot weather mid-summer, coming back into growth in late summer and flowering in the autumn[206]. The flowers seldom set seed in Britain[206]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. This species is widely cultivated for its edible bulb and leaves, mainly in the tropical and sub-tropical areas of Japan, China and many other parts of eastern Asia[58, 183, 266]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.78 Bunias orientalis

Turkish Rocket, Turkish wartycabbage

6 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Bunias orientalis is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves StemEdible Uses: Leaves and young stems - raw or cooked[17, 61, 105, 177, 183]. The young leaves have a mild cabbage flavour that goes very well in a mixed salad, though some people find them indigestible[K]. The leaves are a bit hairy so we find them less than wonderful when eaten raw on their own[K]. The cooked leaves make an excellent vegetable[K]. The leaves are available early in the year, usually towards the end of winter, and the plant will continue to produce leaves until late autumn, with a bit of a gap when the plant is in flower[27, K]. Flower buds and flowering stems - raw or cooked[264]. A pleasant mild flavour with a delicate sweetness and cabbage-like flavour, they make an excellent broccoli substitute though they are rather smaller[K].

tcanta None known

dwatta None known

propta Seed - sow April in a cold frame. Germination is usually very quick and good. Prick out the seedlings into pots as soon as they are large enough to handle and plant them out in early summer. The seed can also be sown in situ in the spring, though the seedlings are rather prone to slug damage[K]. Division in spring. Quick and easy. Root cuttings 2 - 5cm in length succeed at any time during the growing season, though early spring as the plant comes into growth is best[K]. If the top 7 - 10cm of the plant is removed to supply root cuttings and divisions, the roots remaining in the soil usually regrow very quickly[K].

nwatta A very easily grown plant, it succeeds in any soil in a sunny position[1, 200]. Plants have also been seen

growing exceedingly well in the dappled shade of a woodland garden[K]. Plants are quite tolerant of neglect, growing well amongst long grass on our Cornish trial ground[K]. The young spring growth can be quite badly damaged by slugs, though more mature plants grow away so quickly that this does not seem to be a problem[K]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 7.2.79 Brassica juncea

Brown Mustard

6 tlin 9 cyuc 4 kcaak 2 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprikwisslip hpa7tmwatli fyifxre7t hjonli

drutta Brassica juncea is a ANNUAL growing to 0.8 m (2ft 7in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Root SeedEd Uses: Condiment OilLeaves - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The leaves can also be eaten raw, when finely shredded they make a very acceptable addition to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of 'brown mustard'[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. The root of some forms of this species is edible[183]. Sprouted seeds can be added to salads.

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206]. Brassica juncea is used in phytoremediation to remove heavy metals, such as lead, from the soil in hazardous waste sites because it has a higher tolerance for these substances and stores the heavy metals in its cells. In particular, Schneider et al. found that Brassica juncea was particularly effective at removing cadmium from soil.

dwatta Anodyne Antibiotic Aperient Diuretic Emetic Galactogogue Rubefacient StimulantAlthough not usually used medicinally, the seed is a warming stimulant herb with antibiotic effects[238]. Reported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, Brown Mustard is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactogogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

drutta Brassica rapa nipposinica is a BIENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[206]. They can be eaten at any stage from seedling to mature plant though older leaves become fibrous[206]. A very good salad, the leaves can also be cooked as greens or in soups etc[206]. The leaf stalks can also be eaten but require more cooking than the leaves[206]. It can be used as a cut and come again crop. regrowing rapidly after being harvested[206]. Immature flowering stems - cooked like broccoli[206]. A sweet flavour[206].

tcanta None known
dwatta None known

propta Seed - sow in situ or in a seed bed from April to September. Thinnings can be transplanted[206]. Some varieties can also be sown in a cold greenhouse in late autumn or early spring to provide leaves overwinter and in late spring.

nwatta Succeeds in full sun in most well-drained fertile soils[200]. Summer crops tolerate light shade[206]. Prefers a pH of 5.5 to 7[200]. Prefers a cool moist reasonably fertile soil[52]. The plant is shallow rooted and intolerant of drought, it needs to be grown in a moist fertile soil for the best quality leaves[206]. Fairly hardy, tolerating quite hard frosts, though plants are likely to die if this is coupled with wet weather[206]. Plants are also tolerant of summer heat[206]. Mizuna is widely cultivated in China for its edible leaves, there are many named varieties[206]. This plant is one of the most resistant to bolting of the oriental brassicas and can be sown in spring. It can also be planted in the summer for an autumn and winter crop[264]. Mizuna can also be transplanted successfully[206]. A fast growing plant, it can be cropped on a cut and come again basis just 2 - 3 weeks after sowing and has been known to continue cropping for 10 months before going to seed[206]. A very ornamental plant[206].

### 7.2.76 Brassica juncea tsatsai tumida

Swollen-Stem Mustard

6 tin 10 cyuc 4 kcaak 2 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Brassica juncea tsatsai tumida is a ANNUAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Oil Seed Shoots Other Edible Uses: Condiment Oil OilEdible portion: Flowers, Leaves, Oil, Stem, Vegetable. Leaves and leaf stems - raw or cooked[ 22 , 33 , 46 , 52 , 61 ]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[ 206 ]. The leaves can also be finely shredded and added to mixed salads[ 206 ]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[ 183 ]. Flowers and young flowering stems - raw or cooked[ 52 ]. Sweet and succulent[ 133 ]. The stem is trimmed then washed, halved, withered slightly and preserved with salt, cayenne pepper and zanthoxylum pericarps under pressure then marketed. An edible semi-drying oil is obtained from the seed[ 1 , 2 , 17 , 57 , 183 ]. The seed contains 25 - 30% oil[ 74 ]. The seed is used as a mustard flavouring[ 171 ]. It is the source of 'brown mustard'[ 183 ], a prepared mustard that is milder than that produced from other species[ 238 ]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to

produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[ 238 ]. Black mustard comes from B. nigra and white mustard from Sinapis alba. The seed is also used whole in curries and pickles[ 238 ]. They are often heated in oil to destroy their pungency and give them a nutty flavour[ 238 ]. Sprouted seeds can be added to salads. Plants produce swellings on the stem, these can be cooked or pickled[ 206 ].

tcanta Green manure Oil Oil Repellent Soil reclamationOther uses rating: Low (2/5). Agroforestry Uses: There is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[ 206 ]. This is attributed to chemicals that are given off as the plants decay[ 206 ]. Other Uses None known

dwatta Anodyne Antiarthritic Antinflammatory Antirheumatic Antitumor Diuretic Emetic Emmenagogue Foot care Galactogogue Laxative Rubefacient Stimulant TonicReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[ 269 ]. The seed is used in the treatment of tumours in China[ 269 ]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[ 269 ]. The root is used as a galactagogue in Africa[ 269 ]. Ingestion may impart a body odour repellent to mosquitoes[ 269 ]. Mustard oil is used in the treatment of skin eruptions and ulcers[ 269 ]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[ 269 ]. In Java the plant is used as an antisyphilitic emmenagogue[ 269 ]. Leaves applied to the forehead are said to relieve headache[ 269 ]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[ 269 ].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[ 206 ]. It is best not to sow the seed in very hot weather[ 206 ]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[ 269 ].

nwatta Originating from the central Asian Himalayas to China, the plant has long been cultivated and many forms have been developed that can be grown from the temperate to the tropical zones. Succeeds in full sun in most well-drained moisture-retentive fertile soils[ 16 , 200 , 206 ]. Prefers a heavy soil and some shade[ 16 ]. Dislikes very hot weather[ 33 ]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[ 206 ]. A form of B. Juncea that has been selected in the Orient for its edible swollen stem, there are many named varieties[ 206 ]. Plants are reasonably cold-tolerant[ 206 ]. They prefer a fairly high stable temperature and are well adapted to short day length[ 200 ]. Plants have a rooting depth of between 90 - 120 cm[ 269 ]. A good bee plant[ 74 ].

### 7.2.77 Allium chinense

Rakkyo

6 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.3 m hkuc htut cyutli tcup hwicli hyishrasjltu hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Allium chinense is an evergreen Bulb growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root SeedpodEdi Uses: Bulb - raw or cooked[116, 177]. The bulb has an excellent crisp texture with a strong onion flavour[183], it can be 4 - 5cm in diameter, though it does not reach this size until the second or third year[206]. It contains about 3.1% protein, 0.12% fat, 18.3% soluble carbohydrate, 0.7% ash[179]. Leaves - raw or cooked[179]. Flowers and young seedpods - raw[179]. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Astringent Carminative Dysentery Expectorant-The whole plant is astringent, carminative and expecto-

in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy acid soil, it dislikes alkaline soils and becomes chlorotic at pH 6 or higher[11]. Tolerates a pH in the range 5.5 to 7.3. Succeeds in semi-shade but full sun is best for fruit production[3, 126, 200]. Prefers a sheltered position[200]. Does well when grown into trees[K]. Plants requires a 6 - 8 month frost-free growing season[160, 200]. They are hardy to about -12°c when fully dormant but young growth is very subject to damage by late frosts, being killed back at -2°c[160, 200]. Plants also require a winter chilling of 600 - 1100 hours below 7°c and a long warm summer to ripen the fruit[200]. Plants fruit on second year wood or on fruit spurs produced on older wood[126], any pruning is best carried out in the winter[219]. The flowers are sweetly scented[245]. A very ornamental plant[1], it is widely cultivated in warm temperate zones for its edible fruit, there are many named varieties[183, 200]. The fruit can store for up to 9 months at 0°c with a relative humidity of 90%, but under domestic conditions 4 - 6 weeks is optimal[200]. This is a rampant climbing plant, supporting itself by twining around branches etc[200]. Plants have been seen with very good crops of fruit at the Hillier Arboretum in Hampshire in several autumns. These plants had outgrown their planned supports and had climbed 15 metres into neighbouring trees. The main problem with them would be how to harvest the fruit[K]. The female 'Heywood' is the most commonly cultivated form in Britain (1993), its fruits store well but it tends to flower late and there can be problems with pollination[126]. The cultivar 'Blake' is said to be fast cropping and self-fertile[200]. The male 'Tomuri' is free-flowering and disease-resistant[202]. Plants in this genus are notably resistant to honey fungus[200]. Plants are usually dioecious, but hermaphrodite forms are known. However, the fruit quality and yield of these hermaphrodite forms is usually inferior[11]. Male and female plants must usually be grown if seed is required, one male to five or six females is normally adequate. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Woody. Growth habit is a single or multiple shooting vine from a crown [1-2].

### 7.2.7 Semiarundinaria fastuosa

Narihiradake, Narihira bamboo

6 tin 9 cyuc 5 kcaak 2 tcan 0 dwat 7.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Semiarundinaria fastuosa is an evergreen Bamboo growing to 7.5 m (24ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked[25, 61, 177]. The shoots are almost free of any acidity[183]. Although small, they are of good quality when cooked[183]. A plant at Trebah gardens in Cornwall was producing a good amount of new shoots about 35mm in diameter in early April 1995[K]. They are best harvested as

they come through the soil in spring[183]. Do not take too many from any plant since this will weaken the clump.

tcanta Hedge Plant supportThe plant is fairly resistant to maritime exposure and makes a good shelter hedge[K]. A hedge seen in 1987 in an exposed position at Rosewarne in N. Cornwall was looking good even after the severe winter of that year[K]. It needs to be planted fairly closely if a thick hedge is wanted quickly since it is a slow spreader. 60 - 75cm is a good distance. The canes can be used as plant supports[25].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow them on in a lightly shaded place in the greenhouse until large enough to plant out, which could be 2 - 3 years. The plants only flower at intervals of many years and so seed is rarely available. Division as the plants come into growth in spring. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings. Rhizome cuttings.

nwatta Prefers a damp humus-rich soil in sun or semi-shade[200]. Dislikes drought[1]. A slow growing plant, it prefers a position sheltered from cold north and east winds[25] but is fairly tolerant of maritime exposure[K]. A very ornamental and hardy bamboo[195], tolerating temperatures down to about -22°c[25, 200]. Most leaves are produced at the tops of the stems[200]. This species is notably resistant to honey fungus[200]. The plant has a running root-stock but is slow moving and generally well behaved in the British climate. New shoots are produced from late April[25]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

### 7.2.8 Phyllostachys nidularia

Big-Node Bamboo, Broom bamboo

6 tin 9 cyuc 5 kcaak 4 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys nidularia is an evergreen Bamboo growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked. Highly prized in China, both for their earliness and their delicate flavour[195], they taste somewhat

like hominy corn[183]. Neither acrid nor bitter, even in the raw state. The shoots, which are about 4cm in diameter[266] are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta Hedge Hedge Plant support Soil stabilization WoodThe plant has been suggested as being useful for soil and water stabilization on hills and levees[195]. The canes are strong and useful in their whole state, but do not split well[195]. They can be used for plant supports etc.

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position. Dislikes prolonged exposure to hard frosts. New growth begins in early spring. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122].

## 7.2.9 Cephalotaxus fortunei

Chinese Plum Yew

6 tlin 9 cyuc 5 kcaak 3 tcan 1 dwat 6 m hkuc pcmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Cephalotaxus fortunei is an evergreen Shrub growing to 6 m (19ft 8in) at a slow rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit[2]. Fairly large, it is about 30mm x 15mm[200]. We have no further details, though it is closely related to C. harringtonia, the fruit of which is edible raw if fully ripe[K]. The fruit does not always ripen in Britain, before full ripeness it has a disgusting resinous flavour that coats the mouth and refuses to go away for hours[K]. It is quite possible that the seed of this species is also edible[K].

tcanta Hedge HedgeSome forms of this species are procumbent in habit and can be used as ground cover in shady places[200]. Very tolerant of pruning, this plant makes a very good hedge in shady positions[200].

dwatta CancerSubstances from the plant have shown anticancer activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame[113], it should then germinate in the following spring[K]. A hard seedcoat can delay germination, especially in if the seed is not sown as soon as it is ripe[81, K]. Stored seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts.

Greenwood cuttings of terminal shoots, August/September in a humid cold frame[1, 200]. Difficult[113].

nwatta Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W.Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. Although the dormant plant is very cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The Chinese plum yew is a very slow growing shrub or small tree[185] that has excellent potential as a nut crop in Britain. It usually fruits regularly and well in most parts of the country[K] and does well in Cornwall[59]. Trees growing in the shade of other conifers fruit regularly and heavily at Kew Botanical gardens and, unlike most nut trees there, the seeds do not get eaten by the squirrels[K]. Although we have seen no records of edibility for the seed of this species, the closely related C. harringtonia does have edible seed[K]. There are some named forms selected for their ornamental value[200]. ‘Grandis’ is a long leaved female form[200]. ‘Longifolia’ is male but otherwise similar to ‘Grandis’[200]. ‘Prostrata’ (syn ‘Prostrate Spreader’) is a procumbent ground-covering plant that arose as cuttings from a side-shoot of a normal plant[200], a plant of this cultivar was seen with a very heavy crop of immature fruit in mid September 1994 at Hillier Arboretum[K]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year’s leaves, whilst female cones are borne at the base of branchlets[200].

## 7.2.10 Phyllostachys aurea

Golden Bamboo, Fishpole Bamboo

6 tlin 11 cyuc 5 kcaak 0 tcan 0 dwat 6 m hkuc hmim cyutli hgattuc hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys aurea is an evergreen Bamboo growing to 6 m (19ft) by 6 m (19ft) at a fast rate. See above for USDA hardness. It is hardy to UK zone 6. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Seed StemEdible Uses: Young shoots - cooked[61, 105, 177]. They can also be eaten raw and have very little bitterness[183]. They are said to be the sweetest of the genus[25]. The canes are about 15mm in diameter[K]. In China, the new canes are 2 - 5cm in diameter[266]. The shoots are harvested in the spring when about 8cm above the ground, cutting them about 5cm below soil level. Seed - raw or cooked. The seed is only produced at intervals of several years, it can be eaten in all the ways that rice s used and can also be ground into a flour and used as a cereal[183].

tcanta Paper Plant support WoodThe canes make excellent plant supports and are also used for making items such as umbrella handles, walking sticks, fan handles and pipe stems[25, 162, 195]. The canes are very hard but super-flexible[195]. A fibre from the stems is used for making paper[189]. The stems are harvested at any time of the year and crushed with a hammer. They are then cooked for 2 hours or more with lye and beaten in a ball mill for 4 hours. The fibre makes a yellow/gold to cream paper[189].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open

Plant them out in the following spring.

nwatta Agroforestry Services: Living fence Historic Crop Industrial Crop: Fiber Management: StandardLandscape Uses:Border, Massing, Specimen. Thrives in any soil but prefers a sandy loam and full exposure to the south[11]. Plants are hardier when grown on poor sandy soils[200]. Prefers a hot dry position[166], disliking heavy rain[3]. Established plants are very drought resistant[11]. Only hardy in the milder areas of Britain[3, 200]. Another report says that plants are hardy to at least -30°c[164]. A plant at Kew (1992) has survived the last 3 winters outdoors[K]. This plant is still thriving in 1999, though it has not grown much and has not flowered[K]. Another plant is thriving in an open sunny position at Cambridge Botanical Gardens and must have experienced temperatures of at least -10°c, probably somewhat lower[K]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in later years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]. Special Features: North American native, Fragrant flowers, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is multistemmed with multiple stems from the crown [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 7.2.73 Sasa nipponica

Miyako-Zasa

6 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.8 m hkuc hmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Sasa nipponica is an evergreen Bamboo growing to 0.8 m (2ft 7in). See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Young shoots - cooked. They are so popular in Japan that a license is required in order to collect them. Seed - used as a cereal[177]. The seed is only produced at intervals of many years.

tcanta None known

dwatta None known

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°c. Stored seed is best sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse until large enough to plant out, which could be a few years. Plants only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Take large divisions, trying to cause as little root disturbance to the main clump as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Divisions of less than 5 - 6 culms rarely succeed[200].

nwatta Prefers a damp humus rich soil in partial shade[200]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK

fertilizers at this time the plants are more likely to die[122]. The rootstock can be rampant and invasive[200]. Plants are sometimes confused with Sasaella ramosa[200].

## 7.2.74 Brassica juncea strumata

Large Petiole Mustard

6 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxfre7t hjonli

drutta Brassica juncea strumata is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil StemEdible Uses: Oil- Leaves and leaf stems - raw or cooked. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of ‘brown mustard’[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from B. nigra and white mustard from Sinapis alba. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads.

tcanta OilNone known

dwatta Anodyne Aperient Diuretic Emetic Galactogogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisymphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of B. juncea that has been selected in the Orient for its edible swollen stem, there are many named varieties[206]. Plants are reasonably cold-tolerant[206]. They prefer a fairly high stable temperature and are well adapted to short day length[200]. Many are best grown in warmer climates than Britain but there are several cultivars that grow well in this country[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.75 Brassica rapa nipposinica

Mizuna

6 tlin 9 cyuc 4 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxfre7t hjonli

propta Seed - sow outdoors in spring in situ. Germination is usually very quick and free. In order to obtain a continuous supply of edible leaves, successional sowings can be made every few weeks until mid August[33]. A late summer/early autumn sowing can provide leaves in winter, though the plants might require some protection in very cold winters[200].

nwatta A very easily grown and fast-maturing plant, it succeeds in most soils and conditions, though it prefers some shade in summer[52]. Once established, plants are quite drought resistant[160]. Rocket is occasionally cultivated for its edible leaves and flowers, it can be ready for harvest within 40 days of sowing the seed[1, 46, 89, 264], there are some named varieties. 'Rocket Improved' is less prone to bolting, though it still grows best in cooler weather[183]. Plants usually self-sow freely if the ground is disturbed in some way, such as by hoeing[K]. This species is normally untroubled by pests or diseases[160].

### 7.2.71 Brassica rapa parachinensis

False Pak Choi
6 tlin 9 cyuc 4 kcak 0 tcan 0 dwat 0.3 m hkuc
hminhhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Brassica rapa parachinensis is a BIENNIAL growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[206]. They can be eaten at any stage from seedling to mature plant[206]. The leaves are tougher and stronger flavoured than standard Pak choi[206]. The flavour is enhanced after a touch of frost[206]. The leaves are said to be very nutritious, with up to twice the mineral content of Pak choi[206]. Immature flowering stems - cooked like broccoli[206]. A sweet flavour[206]. An edible oil is obtained from the seed.

tcanta None known
dwatta None known

propta Seed - sow in situ July/August. Spring sown crops are prone to run quickly to seed if there is a spell of cold weather[206]. Some varieties can also be sown in a cold greenhouse in autumn or early spring to provide leaves over-winter and in late spring.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Prefers a pH of 5.5 to 7[200]. Prefers a cool moist reasonably fertile soil[52]. The plant is shallow rooted and intolerant of drought, it responds well to a moist fertile soil but succeeds in poorer soils than standard Pak choi[206]. Hardy to about -10°C, the plants stand up well to snow but are less likely to stand up to prolonged winter wet[206]. The prostrate forms are hardier than semi-prostrate forms[206]. The rosette pak choi is widely cultivated in China for its edible leaves, there are several named varieties[206]. It is slower-growing than standard Pak choi, B. rapa chinensis[206].

### 7.2.72 Yucca baccata

Spanish Bayonet, Banana yucca, Blue Yucca, Spanish Yucca
6 tlin 11 cyuc 4 kcak 5 tcan 1 dwat 0.9 m hkuc
htut cyutli hgatyuctcup hwicli hysihrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Yucca baccata is an evergreen Shrub growing to 0.9 m (3ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year, in flower in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and

can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Fruit Leaves Seed Stem Uses: Fully ripe fruit - raw, cooked or dried for winter use[1, 2, 3, 62, 92, 94, 257]. A staple food for several native North American Indian tribes, the fruits are large, fleshy, sweet and palatable[85, 92, 95, 183]. The ovoid fruit is about 17cm long and 7cm wide[200]. Considered to be a luxury by the native North American Indians[207], the fruits were often baked in ovens[216]. The cooked fruit can be formed into cakes and then dried for later use[257]. Large quantities of the fruit has caused diarrhoea in people who are not used to it[85]. The dried fruit can be dissolved in water to make a drink[257]. Flower buds - cooked[2, 62, 95, 183]. A soapy taste[85]. The older flowers are best[85], they are rich in sugar[94]. The flowers, harvested before the summer rains (which turn them bitter), have been used as a vegetable[257]. Flowering stems - cooked[257]. Harvested before the flowers open then roasted[257]. Seed - cooked. It can be roasted and then ground into a powder and boiled[62, 85]. The tender crowns of the plants have been roasted and eaten in times of food shortage[257]. The young leaves have been cooked as a flavouring in soups[257].

tcanta Basketry Brush Fibre Hair Needles Soap String Waterproofing WeavingA fibre obtained from the leaves is used for making ropes, baskets and mats[21, 46, 57, 85, 92, 94, 95]. The fibre can be braided into a good quality rope[257]. The leaves can be reduced into fibre and then made into cloth[257]. To obtain the fibre, the terminal spine and a section of the back of the leaf are removed and pounded to free the fibre from the fleshy portion of the leaf[257]. Another method of obtaining the fibre was to fold the leaves into sections about 10cm long. The leaves were then boiled with a small quantity of cedar ashes. When sufficiently cooked, the leaves were placed in a bowl or basket and cooled, then youths and young women would peel off the epidermis and chew the leaves, starting at one end and finishing at the other. After chewing the leaves, the fibres were separated, straightened out and hung to dry. When required for weaving, they would first be soaked in water to soften them[257]. The whole leaf is sometimes split into sections and then tied together by square knots to make a rope[92, 257]. The leaf can be used as a paint brush[92]. Leaf slivers are used, the end being pounded to reveal the fibres[257]. The leaves have also been used to make small brushes for pottery decoration[257]. The leaf is used in basket making[216, 257]. Small roots have been used in making baskets[257]. They have been used to produce a red pattern in baskets[257]. The leaves can be split and then woven into mats[257]. The leaves can be split and used as a temporary string[257]. The leaf fibre has been braided into ropes[257]. The terminal spines have been used as needles[257]. The dried leaves have been boiled with gum, hardened, ground into a powder then mixed with water and used to make baskets waterproof[257]. The roots are rich in saponins and can be used crushed and then soaked in water to release the suds for use as a soap[21, 85, 95, 216, 257]. It makes a good hair wash[85, 94, 257] and can also be used on the body and for washing clothes[257]. A soap can also be obtained from the leaves and stems[257].

dwatta Antiemetic LaxativeAn infusion of the pulverized leaves has been used as an antiemetic to prevent vomiting[257]. The fruits have been eaten raw as a laxative[257].

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°C. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots in a greenhouse until established[78]. Division of suckers in late spring[3]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well.

ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Landscape Uses:Container, Screen, Specimen. Requires a rich damp soil in a sheltered position[200]. Dislikes prolonged exposure to hard frosts[200]. Established plants are drought resistant[74]. A very hardy bamboo, it succeeds in most parts of Britain[25] but suffers leaf and culm damage at temperatures below about -15°C. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. Although called the 'Golden Bamboo', the leaves of this plant only turn golden if plants are grown in full sun[195], especially if the plants are half-starved. This species is considered by some botanists to be a part of P. bambusoides[25]. Cultivated for its edible shoots in China[25, 162], it has the sweetest taste of the genus[25]. It has been widely planted as an ornamental in the Mediterranean and seems to be naturalizing there[50]. This species is notably resistant to honey fungus[200]. The rootstock is running[25], but not aggressively so, the plant forming fairly tight clumps[195]. New shoots are produced from late May[25]. This is a good companion species to grow in a woodland because the plants have shallow root systems that do not compete with deep tree roots[195]. Special Features:Not North American native, Naturalizing, Inconspicuous flowers or blooms.

### 7.2.11 Cephalotaxus harringtonia drupacea

Japanese Plum Yew
6 tlin 9 cyuc 5 kcak 3 tcan 0 dwat 5 m hkuc
pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Cephalotaxus harringtonia drupacea is an evergreen Shrub growing to 5 m (16ft) by 3 m (9ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Oil OilFruit. - raw or cooked[177]. The fruit closely resembles a plum in its structure, the flesh is thick, juicy and very sweet with a hint of pine in its flavour[2, 183]. The fruit is about 2 - 3cm long[200]. The fruit does not always ripen in Britain, before full ripeness it has a disgusting resinous flavour that coats the mouth and refuses to go away for hours[K]. Seed - raw or cooked[81, 105]. Oily[1]. The seed has a firm texture and a slightly resinous flavour[K].

tcanta Hedge Hedge Oil OilAn oil obtained from the seed is used as an illuminant[105]. Very tolerant of pruning, this plant makes a very good hedge in shady positions[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113], it should then germinate in the following spring[K]. A hard seedcoat can delay germination, especially if in the seed is not sown as soon as it is ripe[81, K]. Stored seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts. Greenwood cuttings of terminal shoots, August/September in

a humid cold frame[1, 200]. Difficult[113].

nwatta Landscape Uses:Border, Foundation, Hedge, Massing, Screen, Woodland garden. Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W. Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. Although the dormant plant is very cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The Japanese plum yew is a very slow growing tree[185] with an excellent potential as a food crop in Britain. This subspecies is growing very well in the shade of other conifers at Kew botanical gardens, where it fruits regularly and heavily. Both the fruit and the seed are edible, these are often eaten in Japan. In addition, the seeds seem to be immune to the predations of squirrels. The seed on trees growing at Kew Botanical gardens are untouched even though virtually every other nut tree there has its crop destroyed[K]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year's leaves, whilst female cones are borne at the base of branchlets[200]. There has been some confusion in the naming of this plant. Some botanists have separated it off as a separate species, C. drupacea, though most nowadays include it as a subspecies of C. harringtonia, differing from the species in its shortly pedunculate male catkins[81]. In cultivation it is often known as the variety 'Fastigiata'[81]. Special Features:Not North American native, Inconspicuous flowers or blooms.

### 7.2.12 Cephalotaxus harringtonia

Japanese Plum Yew
6 tlin 9 cyuc 5 kcak 3 tcan 0 dwat 5 m hkuc
pcimhmim cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli nyanhjen hjonli

drutta Cephalotaxus harringtonia is an evergreen Shrub growing to 5 m (16ft) by 3 m (9ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Oil OilFruit. - raw or cooked. About 2 - 3cm long[200]. The fruit of this plant is said to be astringent and inedible even when fully ripe[200]. However, several of its sub-species produce a very nice sweet fruit - see cultivation details for more information. Seed - raw or cooked[81, 105]. Oily[1] with a slightly resinous flavour[K]. The seed is up to 15mm long.

tcanta Hedge Hedge Oil OilAn oil obtained from the seed is used as an illuminant[105]. Very tolerant of pruning, this plant makes a very good hedge in shady positions[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113], it should then germinate in the following spring[K]. A hard seedcoat can delay germination, especially if in the seed is not sown as soon as it is ripe[81, K]. Stored seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts. Greenwood cuttings of terminal shoots, August/September in a humid cold frame[1, 200]. Difficult[113].

nwatta Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky

soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W. Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. Although the dormant plant is very cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. The Japanese plum yew is a very slow growing tree[185] with an excellent potential as a food crop in Britain. It generally has a large crop of fruit and seeds, these are often eaten in Japan. In addition, the seeds seem to be immune to the predations of squirrels, the seed on trees growing at Kew Botanical gardens being untouched even though virtually every other nut tree there has its crop destroyed[K]. There has been some confusion in the naming of this species. Some botanists have separated off *C. drupacea* as a separate species, though most nowadays include it as a subspecies of this plant as *C. harringtonia* drupacea. (Sieb. and Zucc.)Koidzumi, differing from the species in its shortly pedunculate male catkins[81]. In cultivation it is often known as the variety 'Fastigiata'[81]. Another subspecies, *C. harringtonia* nana. (Nakai)Rehd. is a small spreading shrub to 2 metres, spreading by means of suckers[81, 200]. This form is said to have the best fruit of this genus[200], it is a very hardy plant, succeeding as far north as S. Sweden and Nova Scotia[200]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year's leaves, whilst female cones are borne at the base of branchlets[200]. The plant is heat tolerant in zones 9 through 3. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is mistletemmed with multiple stems from the crown [1-2]. An evergreen.

### 7.2.13 *Crataegus festiva*

6 tlin 9 cyuc 5 kcaak 2 tcan 2 dwat 3 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnykfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Crataegus festiva* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. About 15mm in diameter with a delicious sweet flavour and juicy though slightly mealy texture[K]. This is a very acceptable dessert fruit that makes very enjoyable eating[K]. The fruit can also be used in making pies, preserves, etc, and can be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Wood - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine

as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta We have very little information on this species and do not know how hardy it will be in Britain. However, a tree growing in an open sunny position at Kew Botanical Gardens is healthy and bears a very good crop of fruit every year[K]. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 7.2.14 *Helianthus annuus*

Sunflower, Common sunflower

6 tlin 9 cyuc 5 kcaak 5 tcan 2 dwat 3 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli dyatxre7t hjonli

drutta *Helianthus annuus* is a ANNUAL growing to 3 m (9ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Oil Seed StemEdible Uses: Coffee OilSeed - raw or cooked[4, 14, 94, 101, 183]. A delicious nut-like flavour, but very fiddly to extract due to the small size of the seed. Commercially there are machines designed to do this. Rich in fats, the seed can be ground into a powder[95], made into sunflower butter or used to make seed yoghurt. When mixed with cereal flours, it makes a nutritious bread[244]. Cultivars with up to 50% oil have been developed in Russia[218]. The oil contains between 44 - 72% linoleic acid[218]. The germinated seed is said to be best

with banana pulp and is well adapted as a pie filling[ 183 ]. Flowers and young flowering stems - raw or cooked[ 52 ]. Sweet and succulent[ 133 ]. An edible semi-drying oil is obtained from the seed[ 1 , 2 , 17 , 57 , 183]. The seed contains 25 - 30% oil[ 74 ]. The seed is used as a mustard flavouring[ 171 ]. It is the source of 'brown mustard'[ 183 ], a prepared mustard that is milder than that produced from other species[ 238 ]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[ 238 ]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[ 238 ]. They are often heated in oil to destroy their pungency and give them a nutty flavour[ 238 ]. Sprouted seeds can be added to salads.

tcanta Green manure Oil Repellent Soil reclamationOther uses rating: Low (2/5). Agroforestry Uses: There is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[ 206 ]. This is attributed to chemicals that are given off as the plants decay[ 206 ].

dwatta Anodyne Antiarthritic Antiinflammatory Antirheumatic Antitumor Diuretic Emetic Emmenagogue Foot care Galactagogue Laxative Rubefacient Stimulant TonicReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[ 269 ]. The seed is used in the treatment of tumours in China[ 269 ]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[ 269 ]. The root is used as a galactagogue in Africa[ 269 ]. Ingestion may impart a body odour repellent to mosquitoes[ 269 ]. Mustard oil is used in the treatment of skin eruptions and ulcers[ 269 ]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[ 269 ]. In Java the plant is used as an antisyphilitic emmenagogue[ 269 ]. Leaves applied to the forehead are said to relieve headache[ 269 ]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[ 269 ].

propta Seed - sow in situ from August to October[ 206 ]. Seed can also be sown in the spring but plants are very likely to run to seed[ 206 ]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[ 269 ].

nwatta Originating from the central Asian Himalayas to China, the plant has long been cultivated and many forms have been developed that can be grown from the temperate to the tropical zones. Succeeds in full sun in most well-drained moisture-retentive fertile soils[ 16 , 200 , 206 ]. Prefers a heavy soil and some shade[ 16 ]. Dislikes very hot weather[ 33 ]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[ 206 ]. A form of *B. juncea* that has been selected in the Orient for its large edible leaves, there are many named varieties[ 206 ]. Plants take 3 - 4 months to reach maturity[ 206 ]. They prefer a fairly high stable temperature and are well adapted to short day length[ 200 ]. Plants have a rooting depth of between 90 - 120 cm[ 269 ]. A good bee plant[ 74 ].

### 7.2.69 *Brassica rapa chinensis*

Pak Choi

6 tlin 9 cyuc 4 kcaak 0 tcan 1 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli fyfixre7t hjonli

drutta *Brassica rapa chinensis* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil StemEdible Uses: Oil - Leaves - raw or cooked[46, 52, 61, 116]. They can be eaten at any stage from seedling to mature plant[206]. Well-flavoured, they are sweet with a hint of mustard[206]. The leaves are also dried for winter use[206]. The leaves have

pronounced stems and these can also be eaten, they tend to have a mild, almost bland flavour[206]. A nutritional analysis is available[218]. Immature flowering stems - cooked like broccoli[206]. A sweet flavour[206]. An edible oil is obtained from the seed.

tcanta OilNone known dwatta Antirheumatic Antiscorbutic ResolventThe leaf is antiarthritic, antiscorbutic and resolvent[218].

propta Seed - sow in situ May to August. Spring sown crops are prone to run quickly to seed if there is a spell of cold weather[206]. Some varieties can also be sown in a cold greenhouse in autumn or early spring to provide leaves overwinter and in late spring.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Prefers a pH of 5.5 to 7[200]. Tolerates a pH in the range 4.3 to 7.5. Prefers a cool moist reasonably fertile soil[52]. The plant is shallow rooted and intolerant of drought, it needs to be grown in a moist fertile soil for the best quality leaves[206]. Plants are not tremendously cold-hardy, though they will withstand light frosts[133]. Pak choi is widely cultivated, especially in China, for its edible leaves which are produced mainly in the summer and autumn. A fast-growing plant, there are many named varieties and some can be ready in as little as five weeks from sowing the seed[88, 206, 264]. Forms with green stems tend to stand up better to adverse conditions than white-stemmed forms[206].

### 7.2.70 *Eruca vesicaria sativa*

Rocket

6 tlin 9 cyuc 4 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli hgatkuyctcup hwicli hrasjlutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Eruca vesicaria sativa* is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Oil OilEdible Uses: Condiment Oil OilYoung leaves - raw or cooked[2, 27, 33, 34, 74]. A distinct strongly spicy flavour[183], the taste is best from fast, well-grown plants[200]. A few leaves added to a salad are acceptable though the flavour is too strong for many tastes[K]. Some people really like these leaves though most are not very keen[K]. Older leaves that have become too hot to eat on their own can be pureed and added to soups etc[183]. In the milder areas of Britain it is possible to produce edible leaves all year round from successional sowings, especially if the winter crop is given some protection[K]. Flowers - raw[52]. A similar taste to the leaves, they make a nice garnish on the salad bowl[183]. The seed yields a semi-drying oil[1, 2, 74] which is edible if stored 6 months[61, 114] and is a substitute for rapeseed oil[34]. It contains 32% fat, 27% protein[114]. It is known as 'jamba oil'[183]. A mustard is obtained from the seed[46, 74, 183], the strong flavour comes from an essential oil that is contained within the oil of the seed[114]. The pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238].

tcanta Oil OilThe seed yields a semi-drying oil which is a substitute for rapeseed oil[46]. It can also be used for lighting, burning with very little soot[114].

dwatta Antibacterial Antiscorbutic Aphrodisiac Diuretic Rubefacient Stimulant StomachicRocket was at one time used medicinally, though it is now used only as a salad herb[238]. The leaves are antiscorbutic, diuretic, stimulant and stomachic[4, 46]. The seed is rubefacient and stimulant[4, 46]. The powdered seed possesses antibacterial activity, but no alkaloids have been isolated[240]. The oil from the seed is said to have aphrodisiac properties[264].





seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts. Greenwood cuttings of terminal shoots, August/September in a humid cold frame[1, 200]. Difficult[113]. Division of self-layered stems and suckers in early autumn or mid-spring.

nwatta Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W. Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. The dwarf Japanese plum yew is a very slow growing plant[185] with an excellent potential as a food crop in Britain. The fruit and the seed are often eaten in Japan. In addition, the seeds seem to be immune to the predations of squirrels, the seed on trees growing at Kew Botanical gardens being untouched even though virtually every other nut tree there has its crop destroyed[K]. This sub-species is a small spreading shrub to 2 metres, spreading by means of suckers[81, 200]. It is said to have the best fruit of this genus[200]. It is also a very frost-resistant plant, succeeding as far north as S. Sweden and Nova Scotia[200]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year's leaves, whilst female cones are borne at the base of branchlets[200].

## 7.2.16 Gaultheria shallon

Shallon, Salal

6 tin 9 cyuc 5 kcaak 3 tcan 2 dwat 1.2 m hkuc pcmhmimhtut cyutli hgatyuctcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Gaultheria shallon is an evergreen Shrub growing to 1.2 m (4ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw, cooked or dried for later use[2, 3, 4, 183]. Sweet and juicy with a pleasant flavour[11, 95, 101], it makes good raw eating[K]. The fruit can also be made into preserves, pies, drinks etc or be dried and used like raisins[183]. The fruit is about 10mm in diameter[200] and is produced over a period of several weeks in late summer[K]. A pleasant tea is made from the leaves[101].

tcanta DyeA purple dye is obtained from the fruit[99]. It is dark green[168]. A greenish-yellow dye is obtained from the infused leaves[257]. A ground cover plant for a shady position under trees, spreading slowly by means of suckers[188]. It should be spaced about 90cm apart each way[208].

dwatta Astrigent Poulitce StomachicA poultice of the toasted, pulverized leaves has been applied to cuts[257]. A poultice of the chewed leaves has been applied to burns and sores[257]. The leaves have been chewed to dry the mouth[257]. An infusion of the leaves have been used as a stomach tonic and a treatment for diarrhoea, coughs, TB etc[257].

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping

off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring when new growth is about 7cm tall. Divided plants can be rather slow to get established[182]. We have found that it is best to pot up the clumps and grow them on in a shady position in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Erping control, Ground cover, Hedge, Massing. Prefers a moist but not boggy humus rich soil in shade or semi-shade[11, 182], but it can also succeed in full sun. A peat and moisture loving species, it requires a lime-free soil[11, 182]. One report says that it can succeed in dry shade[188] and another that it can withstand considerable drought once it is established[208]. Plants are hardy to about -20°C[184]. A vigorous suckering plant, it can be invasive when growing in good conditions, but responds to cutting back[1, 28]. It also succeeds when planted under trees[28, 49]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a running thicket former forming a colony from shoots away from the crown spreading indefinitely [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2]. The root pattern is stoloniferous rooting from creeping stems above the ground [1-2].

## 7.2.17 Cephalotaxus harringtonia koreana

Korean Plum Yew

6 tin 9 cyuc 5 kcaak 3 tcan 0 dwat 1.5 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Cephalotaxus harringtonia koreana is an evergreen Shrub growing to 1.5 m (5ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit Oil Oil SeedEdible Uses: Oil OilFruit. - raw or cooked. Fairly large, about 3cm long[200]. We have no information on this sub-species but assume that the fruit and seed will be edible[K]. The fruit does not always ripen in Britain, before full ripeness it has a disgusting resinous flavour that coats the mouth and refuses to go away for hours[K]. Seed - raw or cooked. Oily.

tcanta Hedge Hedge Oil OilAn oil obtained from the seed is used as an illuminant[105]. Very tolerant of pruning, this plant makes a very good hedge in shady positions[200].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[113], it should then germinate in the following spring[K]. A hard seedcoat can delay germination, especially

little resistance to drought[206]. They require about 5 gallons of water from sowing to maturity[206]. Plants are not fully winter hardy in Britain, though mature plants withstand light frosts to about -3°C[160, 206]. Plants prefer coolish weather during their growing season, a temperature range of 13 - 20°C is ideal[206]. The Chinese cabbage is widely cultivated, especially in China and Japan, for its edible leaves[88]. It looks like a large cos lettuce or cabbage and has a crisp, watery texture with a mustard-like taste[264]. There are many named varieties[88, 206]. Those forms with loose heads were developed for areas with hotter summers, whilst compact-headed forms were developed for cooler areas[206]. The loose-headed forms are less prone to bolt, are more resistant to cold and are more disease-resistant[206]. An annual to biennial species, it is normally grown as an annual[206]. Plants take from 55 - 100 days from sowing to maturity, depending on variety, the loose-headed forms are usually 2 - 3 weeks faster than compact-headed forms[206]. Plants do not like root disturbance so should not be transplanted unless grown in individual pots[206]. Plants are highly resistant to fungus attacks and the cabbage moth[160], they are also slow to bolt in hot weather[160]. Some cultivars are more resistant to bolting when sown in spring than other forms[206]. There is some evidence that interplanting this species with dill and garlic can lessen the attacks of caterpillars[206]. A good bee plant[108].

## 7.2.64 Brassica juncea integrifolia strumata

Large Petiole Mustard

6 tin 10 cyuc 4 kcaak 2 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Brassica juncea integrifolia strumata is a ANNUAL growing to 0.8 m (2ft 7in) by 0.8 m (2ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Seed Sheds, Stems, Foliage Uses: Condiment OilLeaves and leaf stems - raw or cooked. Flowers and young flowering stems - raw or cooked[ 52 ]. Sweet and succulent[ 133 ]. An edible semi-drying oil is obtained from the seed[ 1, 2, 17, 57, 183 ]. The seed contains 25 - 30% oil[ 74 ]. The seed is used as a mustard flavouring[ 171 ]. It is the source of 'brown mustard'[ 183 ], a prepared mustard that is milder than that produced from other species[ 238 ]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[ 238 ]. Black mustard comes from B. nigra and white mustard from Sinapis alba. The seed is also used whole in curries and pickles[ 238 ]. They are often heated in oil to destroy their pungency and give them a nutty flavour[ 238 ]. Sprouted seeds can be added to salads.

tcanta Green manure Oil Repellent Oil reclamationOther uses rating: Low (2/5). Agroforestry Uses: There is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[ 206 ]. This is attributed to chemicals that are given off as the plants decay[ 206 ].

dwatta Anodyne Antiarthritic Antinflammatory Antirheumatic Antitumor Diuretic Emetic Emmenagogue Foot care Galactogogue Laxative Rubefacient Stimulant TonicReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[ 269 ]. The seed is used in the treatment of tumours in China[ 269 ]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[ 269 ]. The root is used as a galactagogue in Africa[ 269 ]. Ingestion may impart a body odour repellent to mosquitoes[ 269 ]. Mustard oil is used in the treatment of skin eruptions and ulcers[ 269 ]. Believed to be aperient and tonic, the volatile oil is used

as a counterirritant and stimulant[ 269 ]. In Java the plant is used as an antispilhitic emmenagogue[ 269 ]. Leaves applied to the forehead are said to relieve headache[ 269 ]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[ 269 ].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[ 206 ]. It is best not to sow the seed in very hot weather[ 206 ]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[ 269 ].

nwatta Originating from the central Asian Himalayas to China, the plant has long been cultivated and many forms have been developed that can be grown from the temperate to the tropical zones. Succeeds in full sun in most well-drained moisture-retentive fertile soils[ 16, 200, 206 ]. Prefers a heavy soil and some shade[ 16 ]. Dislikes very hot weather[ 33 ]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[ 206 ]. A form of B. Juncea that has been selected in the Orient for its edible swollen stem, there are many named varieties[ 206 ]. Plants are reasonably cold-tolerant[ 206 ]. They prefer a fairly high stable temperature and are well adapted to short day length[ 200 ]. Plants have a rooting depth of between 90 - 120 cm[ 269 ]. A good bee plant[ 74 ].

## 7.2.65 Allium scorodoprasum

Rocambole, Sand leek

6 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Allium scorodoprasum is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[5, 46]. A garlic substitute[22, 27, 37, 38]. It is used as a flavouring in salads, soups etc[238]. The bulbs are smaller than garlic and have a milder flavour, they are produced at the points of the stem as well as at the base[2]. The bulbs are 10 - 20mm in diameter[200]. Leaves - raw or cooked[238]. Used as a flavouring in salads etc[238]. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Cholera Depurative Digestive DysenteryThe plant is digestive and depurative[178]. The bulb is used in the treatment of abscesses, amoebic dysentery, bronchitis, cholera, dysentery, influenza, skin diseases and TB[218].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. Thrives in poor dry soils[238]. The bulbs should be planted fairly deeply[1]. Many forms of this species produce numerous bulbils in the flowering head[203]. The plants can become very invasive by means of these bulbils[203]. The sub-species A. scorodoprasum jajlae and A. scorodoprasum rotundum do not produce bulbils[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Occasionally cultivated, especially in Russia, for its edible bulb[183]. Members of this genus are rarely if ever troubled by browsing deer[233].

folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sow in situ from June to October. Spring-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* that has been selected for its edible leaves, there are many named varieties[206]. They prefer a fairly high stable temperature and are well adapted to short day length[200]. Many are best grown in warmer climates than Britain but there are several cultivars that grow well in this country[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

### 7.2.62 Brassica juncea integrifolia subintegrifolia

Leaf Mustard

6 tlin 10 cyuc 4 kcaak 2 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Brassica juncea integrifolia subintegrifolia is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Seed Shoots Uses: Condiment OilLeaves - raw or cooked[ 22, 33, 46, 52 , 61 ]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[ 206 ]. The leaves can also be finely shredded and added to mixed salads[ 206 ]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[ 183 ]. Flowers and young flowering stems - raw or cooked[ 52 ]. Sweet and succulent[ 133 ]. An edible semi-drying oil is obtained from the seed[ 1 , 2 , 17 , 57 , 183 ]. The seed contains 25 - 30% oil[ 74 ]. The seed is used as a mustard flavouring[ 171 ]. It is the source of 'brown mustard'[ 183 ], a prepared mustard that is milder than that produced from other species[ 238 ]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[ 238 ]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[ 238 ]. They are often heated in oil to destroy their pungency and give them a nutty flavour[ 238 ]. Sprouted seeds can be added to salads.

tcanta Green manure Oil Repellent Soil reclamationOther uses rating: Low (2/5). Agroforestry Uses: There is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[ 206 ]. This is attributed to chemicals that are given off as the plants decay[ 206 ]. Other Uses None known

dwatta Anodyne Antiarthritic Antinflammatory Antirheumatic Antitumor Diuretic Emetic Emmenagogue Foot care Galactogogue Laxative Rubefacient Stimulant TonicRe-

ported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[ 269 ]. The seed is used in the treatment of tumours in China[ 269 ]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[ 269 ]. The root is used as a galactagogue in Africa[ 269 ]. Ingestion may impart a body odour repellent to mosquitoes[ 269 ]. Mustard oil is used in the treatment of skin eruptions and ulcers[ 269 ]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[ 269 ]. In Java the plant is used as an antisyphilitic emmenagogue[ 269 ]. Leaves applied to the forehead are said to relieve headache[ 269 ]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[ 269 ].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[ 206 ]. It is best not to sow the seed in very hot weather[ 206 ]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[ 269 ].

nwatta Originating from the central Asian Himalayas to China, the plant has long been cultivated and many forms have been developed that can be grown from the temperate to the tropical zones. Succeeds in full sun in most well-drained moisture-retentive fertile soils[ 16 , 200 , 206 ]. Prefers a heavy soil and some shade[ 16 ]. Dislikes very hot weather[ 33 ]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[ 206 ]. A form of *B. juncea* with entire leaves that has been selected in the Orient for its edibility. There are many named varieties[ 206 ]. A very fast growing variety, usually maturing within 40 days of sowing[ 206 ]. The plants in this group are fairly cold-tolerant[ 206 ]. Plants have a rooting depth of between 90 - 120 cm[ 269 ]. A good bee plant[ 74 ].

### 7.2.63 Brassica rapa pekinensis

Chinese Cabbage

6 tlin 9 cyuc 4 kcaak 2 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica rapa pekinensis is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[116, 160, 171]. A crisp, watery texture with a naturally sweet taste, it is best eaten raw in salads[116, 206]. The plant can be eaten as a young seedling, or left to grow into a mature plant[206]. The flavour is quickly ruined by prolonged cooking[206]. Leaves can also be dried for winter use[206]. The heads of mature plants can be 50cm long and weigh up to 4.5 kg[200, 206]. Fresh leaves do not store well and are best used within a day or two of harvesting[206]. A nutritional analysis is available[218]. Flowering shoots - raw or cooked[206]. Sweet and tender[133].

tcanta Dynamic accumulator.

dwatta DepurativeThe leaves are depurative[218].

propta Seed - it can be sown from late May to September in situ[206]. The spring sown crops often run to seed very quickly but 'barrel' types can be sown at this time. If seedlings are germinated at a temperature of 18 - 20°C and then grown on at this temperature for their first few weeks, they are then less likely to bolt[206]. Seed usually germinates within 3 - 4 days[206]. A late summer sowing under protection can provide leaves in the winter[206]. Seedlings can be transplanted when about 3 - 4 weeks old[206].

nwatta Succeeds in a well-drained fertile preferably alkaline soil[16, 52, 200]. Succeeds in acid and alkaline soils[166, 200]. Prefers a pH in the range 6.5 to 7[206]. Tolerates a pH in the range 4.3 to 6.8. Prefers a heavy soil[16] and grows badly in sandy ones[200]. Prefers full sun[200, 206] and a sheltered position[206]. Likes some shade[16]. Drought resistant according to one report[160], whilst another says that the plants are shallow-rooted and have very

in if the seed is not sown as soon as it is ripe[81, K]. Stored seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts. Greenwood cuttings of terminal shoots, August/September in a humid cold frame[1, 200]. Difficult[113].

nwatta Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W. Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. A very slow growing plant[185], a 20 year old specimen at Kew was only 1.3 metres tall[K]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year's leaves, whilst female cones are borne at the base of branchlets[200]. This sub-species is more frost hardy than the type species, it succeeds as far north as S. Sweden and Nova Scotia if given a sheltered position[200].

### 7.2.18 Malva verticillata

Chinese Mallow, Cluster mallow

6 tlin 12 cyuc 5 kcaak 2 tcan 2 dwat 1.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Malva verticillata is a ANNUAL/BIENNIAL growing to 1.7 m (5ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - raw or cooked[2, 51, 61, 100, 183]. The leaves of well-grown plants can be 15cm or more across. They have a mild and very pleasant flavour that makes an excellent addition to salads[K]. We use them as a tasty alternative to the lettuce[K]. Young seeds - raw or cooked. Used when green and immature[85]. A pleasant nutty taste but the seed is too small and fiddly for most people to want to harvest[K].

tcanta DyeCream, yellow and green dyes can be obtained from the plant and the seed heads[168 ]. An extract of the leaves, flowers and stems is used as an ingredient in commercial cosmetic preparations as a skin conditioner[1243 ]. An essential oil obtained from the seeds is used as an ingredient in commercial cosmetic preparations as an emollient and skin conditioner[1243 ]. The following were listed under *Malva meluca* and *mohileviensis* (both now considered to be synonyms of this species) The seed contains up to 10 - 20% of a greenish oil with an iodine number 116.9[74 ]. It is used for making soap[74 ]. The fibre obtained from the stem is a useful substitute for jute in cordage production. The fibre is strong, but somewhat coarse and brittle. It is inferior in quality to kenaf and hemp. The fibre has a breaking strength of 14 kilos without a knot and 9 - 10 kilos with a knot[74 ].

dwatta Demulcent Digestive Diuretic Emollient Galactogogue LaxativeThe seed contains mucilage, polysaccharides and flavonoids[279]. It is demulcent, diuretic, emollient, galactogogue and laxative[147, 176, 218]. The seeds are used in Tibetan medicine, where they are considered to have a sweet and astringent taste plus a heating potency[241]. They are used in the treatment of renal disorders, the retention of fluids, frequent thirst and diarrhoea[241]. The root is used to cause vomiting in the treatment of whooping cough[240]. The leaves and stems are said to be digested[240]. They are given to women in the advanced stages of pregnancy[240].

propta Seed - sow early spring in situ. Germination should take place within 2 weeks.

nwatta A very easily grown plant, succeeding in ordinary garden soil[1], though it prefers a reasonably well-drained and moderately fertile soil in a sunny position[200]. This species is cultivated as a salad crop in parts of Europe[17, 50, 51]. There is at least one named variety- 'Crispa' has more tender leaves than the species with curled leaf edges that make it look more attractive in salads. This species was one of the earliest domesticated crops in China, it has been in cultivation for well over 2,500 years[183]. Plants seem to be immune to the predations of rabbits[233]. Plants are prone to infestation by rust fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

### 7.2.19 Oxalis tuberosa

Oca

6 tlin 9 cyuc 5 kcaak 0 tcan 0 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasjut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Oxalis tuberosa is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Tubers - raw or cooked[2, 103, 183]. An acid lemon flavour when first harvested, if left out in the sun the tubers turn sweet[183], so sweet in some varieties that they are said to resemble dried figs and are sold as fruits in local markets in S. America[34, 37, 97, 196]. The cooked root is delicious whether in its sweet or acid state, it can be boiled, baked etc in similar ways to potatoes[K]. The tubers tend to be rather smaller than potatoes, with good sized specimens reaching 8cm or more in length. The slightly waxy skin makes cleaning them very easy[K]. They contain about 70 - 80% moisture, 11 - 22% carbohydrate, 1% fat, 1% fibre and 1% ash[196]. The carbohydrate is rich in sugar and easy to digest[196]. Acid types are rich in oxalic acid (up to 500ppm) but sweet forms have much less oxalic acid than is found in potatoes[196]. Edible young leaves and flowers - raw or cooked[34, 37, 103]. Poor quality[33]. Use in moderation, see notes at top of sheet,

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in late spring or early summer. Seed is not usually produced in Britain. Harvest the tubers in late autumn after the frosts have killed off top growth. Store in a cool dry frost free place and plant out in April. Basal cuttings in spring[196]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Prefers a light rich soil in a warm sunny position[1, 37, 196]. Tolerates a pH range from 5.3 to 7.8[196]. Plants succeed in areas with an average rainfall ranging from 570 - 2150mm per year[196]. Oka is widely cultivated in the Andes for its edible tubers, there are many named varieties[33, 97]. This species has an excellent potential as a major root crop in temperate zones, it has the potential to yield as highly as potatoes but does not have the susceptibility to pests and diseases that are a bughane for potato growers[K]. Plants are slightly more hardy than the potato, tolerating light frosts but the top-growth being severely damaged or killed by temperatures much below freezing. The main drawback is that development of the tubers is initiated by the number of hours of daylight in a day. In Britain this means that tubers do not begin to form until after the 21st of September and, if there are early frosts in the autumn, yields

will be low[37]. There are possibly some forms in southern Chile that are not sensitive to daylength, these will be more suitable to higher latitudes such as Britain[196]. It is said that the varieties with white tubers are bitter because they contain calcium oxylate crystals whilst those with tubers that are of other colours are sweet[97]. However, we are growing one variety with white tubers and it most certainly is not bitter[K]. Yields tend to average about 7 - 10 tonnes per hectare but experimentally yields of 40 tonnes per hectare have been achieved[196]. Earthing up the growing stems as they start to form tubers can increase yields significantly[196].

## 7.2.20 Pinus armandii

Chinese White Pine, Armand pine

6 tlin 9 cyuc 4 kcak 2 tcan 2 dwat 15 m hkuc htut cyutli hgtakuyctcup hwicli hyhshrasjlt hpa7tli flatprik hpa7tmwathi dyat hjonli

drutta Pinus armandii is an evergreen Tree growing to 15 m (49ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: CondimentSeed - raw or cooked[63]. Esteemed as a great delicacy[105, 177, 183], the oil-rich seed has a slightly resinous flavour. Up to 13mm x 11mm[200]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulp-wood[200].

tcanta Dye Herbicide WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - soft. The timber is used for construction, railway sleepers, furniture, and wood fibre[46, 61, 266].

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects

root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Thrives in a light well-drained sandy or gravelly loam[1]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. This species grows well in Britain[120]. The best growth in this country is found in Sussex, trees also grow well in Ireland. Annual increases in height are normally moderate but the best trees have been increasing by 60cm a year. Increase in girth can be as high as 5cm a year[185]. A plant at Kew, accession no 000-69.10663, was bearing a good crop of cones in 2000[K]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2]. An evergreen. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 7.2.21 Broussonetia papyrifera

Paper Mulberry

6 tlin 11 cyuc 4 kcak 3 tcan 2 dwat 9 m hkuc htut cyutli hgtakuyctcup hwicli hyhshrasjltunyk hpa7tli frusflatprikwis hpa7tmwathi nyanhjen hjonli

drutta Broussonetia papyrifera is a deciduous Tree growing to 9 m (29ft) by 9 m (29ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. It is in flower from August to September, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Fruit LeavesEdible Uses: Fruit - raw[2, 105, 177, 179]. The fruit comprises a ball about 1.5cm in diameter with numerous small edible fruits protruding - there is not much edible flesh but it has a lovely flavour[K]. Prolonged ingestion is said to weaken the bones[179]. Leaves - cooked[105]. The dried leaf contains 1% calcium carbonate[179](this report does not mention edibility). Flowers[179]. No more details.

tcanta Fibre Fodder Leather Paper WoodA fibre from the bark is used in making paper, cloth, rope etc[46, 61, 114, 171]. The fibre can be produced by beating strips of bark on a flat surface with a wooden mallet. A very fine cloth can be made in this way, the more the bark is beaten the finer the cloth becomes. Larger sizes can be made by overlapping 2 pieces of bark and beating them together. A leather substitute can also be made from the bark[171]. When used for making paper branches are harvested after the leaves have fallen in the autumn, they are steamed and the fibres stripped off. In humid areas this can be done without steaming the branches. The inner and outer bark are then separated by scraping (or simply peeling in humid areas) and the fibres are cooked for 2 hours with lye before being hand pounded

male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: TeaFruit - raw or cooked[183]. Aromatic and delicious[2, 62, 106] with a flavour of wintergreen. Often used in preserves[183]. The fruit is about 6mm in diameter[200]. Leaves - raw[62]. Used as a wayside nibble[85]. The young tender leaves are especially suited for use as greens[183]. They have a delicate flavour of wintergreen. A tea is made from the fresh or dried leaves[62, 85, 183].

tcanta DyeA ground cover plant for positions in the sun or light shade. A black dye has been made from the plant[257].

dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring. Layering.

nwatta Prefers a moist but not boggy humus rich soil in sun or semi-shade[11]. This species requires a lot of shade[1]. A peat and moisture loving species, it requires a lime-free soil[11]. The plant can make a good nesting place for mice, these mice then eat the bark of the stems in winter causing die-back. Grows well in a rock garden[11]. This species is closely allied to *G. ovatifolia*[1]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.60 Lomatium nudicaule

Pestle Parsnip, Barestem biscuitroot

6 tlin 8 cyuc 4 kcak 2 tcan 2 dwat 0.6 m hkuc htut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatprikwis hpa7tmwathi fyfxxre7t hjonli

drutta Lomatium nudicaule is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Root StemEdible Uses: TeaRoot - raw or cooked[207]. The taste is rather like a hot spicy parsnip[207]. The root can be roasted and used as a vegetable, or can be dried and ground into a powder then used as a flavouring in soups etc[105, 161]. Leaves and young shoots - eaten as a vegetable or used as a celery-like flavouring in soups etc[177, 183, 257]. The leaves, stems and flowers are infused and used as a beverage[161, 183, 257]. Seed - raw or cooked[257]. The immature seed is chewed as a refreshing snack and can be used as a flavouring in soups etc[257]. The vitamin C content of young plants is remarkably high, one cup providing more than the recommended daily allowance[183]. (the part of the plant is not referred to, it is probably the leaves)

tcanta Incense RepellentThe seed is spicy and aromatic, it is used as a house fumigant and deodorant. It also repels mosquitoes[99].

dwatta Analgesic Diaphoretic Febrifuge Laxative Pectoral Poultice Vitamin CThe seeds are analgesic, diaphoretic, febrifuge, laxative and pectoral[257]. They have been chewed in the treatment of fevers, colds and sore throats[257]. An infusion has been used by pregnant women to ensure an easy delivery[257]. A poultice of the crushed seeds has been applied to the head to relieve the pain of headaches[257]. The poultice has also been applied to sore places, pains and itches[257].

propta Seed - best sown as soon as it is ripe in a cold frame[188]. Stored seed can be rather slow to germinate, when sown in the spring it usually takes at least 12 months to germinate. Giving it a period of cold stratification might reduce this time. The seedlings need to be pricked out into individual pots as soon as they are large enough to handle, and should be planted out into their permanent positions in the summer. Fresh seed can be sown immediately in situ[188]. Division may be possible in spring or autumn.

nwatta Requires a sunny position in a fertile well-drained soil[188]. Plants are frost hardy[188]. This is a taxonomically very difficult genus, many of the species now included in it have at times been included in other genera[60]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 7.2.61 Brassica juncea multiceps

Green In The Snow

6 tlin 9 cyuc 4 kcak 0 tcan 2 dwat m hkuc hpmihmtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikwis hpa7tmwathi fyfxxre7t hjonli

drutta Brassica juncea multiceps is an ANNUAL growing to 0.4 m (1ft 4in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves OilEdible Uses: Condiment OilLeaves - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The young raw leaves are pleasantly spicy but older leaves, particularly when the plant runs to seed, can become overpoweringly hot though they are still nice cooked at this stage[206]. The leaves can be finely shredded and added to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of "brown mustard"[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. The root of some forms of this species is edible[183]. Sprouted seeds can be added to salads.

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactagogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a

full sun in most well-drained moisture-retentive fertile soils[ 16 , 200 , 206 ]. Prefers a heavy soil and some shade[ 16 ]. Dislikes very hot weather[ 33 ]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[ 206 ]. Plants have a rooting depth of between 90 - 120 cm[ 269 ]. A good bee plant[ 74 ].

### 7.2.57 Brassica juncea crispifolia

Curled Mustard

6 tin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhut cyutli kcuypc hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta Brassica juncea crispifolia is an ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves OilEdible Uses: Condiment OilLeaves - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The leaves can also be finely shredded and added to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of 'brown mustard'[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads.

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactogogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* with curled leaves that has been selected in the Orient for its edibility. There are some named varieties[206]. Plants in this group are fairly cold-tolerant and often stand the winter, they

are then slow to bolt and can supply a good crop of leaves in the spring[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

### 7.2.58 Quercus ithaburensis macrolej

Valonia Oak

6 tin 9 cyuc 4 kcaak 0 tcan 2 dwat m hkuc hmimhut cyutli kcuypc hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus ithaburensis macrolepis is a deciduous Tree growing to 15 m (49ft) by 13 m (42ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Manna SeedEdible Uses: CoffeeSeed - raw or cooked[2, 63, 89, 100]. The seed is quite big, about 4cm x 3cm[200] and is very low in tannin[183]. Any bitter seeds can be leached by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. Roasted seed is a coffee substitute. A manna is obtained from the tree[183]. No further details.

tcanta Dye Ink Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. The acorn cups contain about 45% tannin[171, 223]. A black dye can be obtained from them[89] and it can be used as an ink[100]. Gall-like excretions on the plant are caused by damage from the insect *Cynips calicis*. These growths contain about 30% tannin[223].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, but trees usually grow well in Britain[200]. The seed takes two years to ripen but is seldom produced in this country[11]. Hybridizes freely with other members of the genus[200]. This species is notably resistant to honey fungus[88, 200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11].

### 7.2.59 Gaultheria humifusa

Alpine Wintergreen, Alpine spicwintergreen

6 tin 9 cyuc 4 kcaak 3 tcan 0 dwat 0.1 m hkuc hmimhut cyutli tucp hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Gaultheria humifusa is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both

with mallets. The paper varies in colour if the outer and inner barks are used together or separately[189]. Wood - coarse grained, soft, easily worked, light, not very durable. Used for cups, bows, furniture etc[149, 158, 178, 229, 266]. Its timber does not have high commercial value. Animal feed, fodder, forage: Fodder/animal feed, Invertebrate food for silkworms. Environmental Uses: Agroforestry. Erosion control or dune stabilization. Revegetation. Shade and shelter. Soil improvement. Windbreak. [1d].

dwatta Astringent Diaphoretic Diuretic Dysentery Galactogogue Haemostatic Laxative Ophthalmic Skin Stimulant Stomachic Tonic VulneryAstringent, diuretic, tonic, vulnery[178]. The leaf juice is diaphoretic and laxative - it is also used in the treatment of dysentery[218]. It is also poulticed onto various skin disorders, bites etc[218]. The stem bark is haemostatic[218]. The fruit is diuretic, ophthalmic, stimulant, stomachic and tonic[218]. The root is cooked with other foods as a galactogogue[218].

propta Seed - no pre-treatment is required. Sown in the autumn or spring in a greenhouse, germination usually takes place within 1 - 3 months at 15°C[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8 - 12cm long with a heel, July/August in a frame. High percentage[11, 78]. Cuttings of mature wood of the current season's growth, November in a frame[200]. Root cuttings in winter[200]. Layering in spring[200].

nwatta Management: Coppice Regional CropEasily cultivated in a warm sunny position in any soil of reasonable quality[11]. A drought resistant species once established[149], thriving on poor sandy or gravelly soils[200, 229]. Another report says that it does not thrive on poor soils[146]. Tolerates atmospheric pollution[200]. A fast-growing tree according to one report[227], but whilst it might be fast in relation to other members of the genus, it is only of moderate growth compared to some species[K]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to about -10°C[200]. The young growing in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. There is a superb specimen of this tree at Cambridge Botanical gardens, in the late summer of 1996 it was about 12 metres tall and 16 metres wide and was bearing a huge crop of immature fruit[K]. The leaves on the same tree can vary widely in shape and size[K]. The paper mulberry is widely cultivated in E. Asia for the fibre in its bark, there are many named varieties[11, 200]. Trees are coppiced annually for this purpose[4], though the coppice interval in countries such as Britain would probably be 2 - 3 years. This is a very adaptable tree, it is found growing in tropical climates but its range also extends well into the temperate zone. Dioecious. Male and female plants must be grown if seed is required. Special Features:Not North American native, Invasive, Inconspicuous flowers or blooms.

### 7.2.22 Phyllostachys bambusoides

Madake, Japanese timber bamboo

6 tin 9 cyuc 4 kcaak 3 tcan 1 dwat 8 m hkuc hmim cyutli tucp hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys bambusoides is an evergreen Bamboo growing to 8 m (26ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked as a vegetable[25, 46, 105]. Large but somewhat acid when raw[61], they require boiling in a lot of water or in several changes of water[183]. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level. The shoots contain about 2.1% protein, 0.3% fat, 3.2% carbohydrate, 0.9% ash[179].

tcanta Soil stabilization WoodThe plant has an extensive root system and is used for erosion control. The stems are used for making furniture, plant supports etc[46, 61, 74]. Fairly thick walled, the canes are considered to be the most versatile of this genus and are used in construction and other industrial uses[195]. Splints made from the stems are good for weaving various bamboo articles[266]. Even the dead culms are durable[195].

dwatta AntipyreticThe leaves are antipyretic[218]. New shoots are used in the treatment of haematuria[218].

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Industrial Crop: Biomass Management: Managed Multistem Minor Global Crop Other Systems: MultistrataRequires a rich loamy soil and plenty of moisture in the growing season[1] plus a sheltered position[200]. A very hardy plant[11, 25], tolerating temperatures down to about -18°C, but it dislikes prolonged exposure to hard frosts[200]. Plants can reach 25 metres in height in their native habitat, they are much smaller in Britain but, even so, a height of 12 metres has been recorded in Cornwall. Cultivated for its edible shoots in China[183], it is the most widely grown bamboo in Japan for its useful canes[195]. It has been widely planted for ornament in the Mediterranean and is becoming naturalized there[50]. There are some named forms selected for their ornamental value[200]. 'Castillon' has smaller culms than the species type, the edible shoots are less bitter[195]. A plant of this cultivar at Trebah gardens in Cornwall was growing well in woodland shade, it was 5 metres tall with canes 20mm in diameter[K]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. The rootstock is running but not aggressively so, especially in the cooler climate of Britain[25]. New shoots are produced from late May[25]. Individual stems can be long lived, staying leafy for up to 20 years[195]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of several years, viable seed is usually produced[122]. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They usually die after flowering, but if left alone they will sometimes recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122].

### 7.2.23 Phyllostachys edulis

Moso-Chiku, Tortoise shell bamboo

6 tin 10 cyuc 4 kcaak 0 tcan 1 dwat 8 m hkuc hmim cyutli tucp hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys edulis is an evergreen Bamboo growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked[1, 11, 105]. Very palatable when cooked but acrid raw[25, 74, 183]. Not of the highest quality, but their large size makes them very popular[195]. Extensively eaten in China, they are usually cooked in one change of water[183]. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level. The dormant young shoots, harvested in the

winter before they emerge above the ground, are especially relished as a delicacy[183, 195].

tcanta Containers Fodder Pipes WoodThe canes make good water pipes[74], they are also used for household utensils etc[25]. The short internodes at the lower end of the cane are used as flasks, vases etc[74]. Although the wood is relatively soft, the canes are much used for heavy construction, weaving various types of handicrafts and paper making[195]. The rhizomes are used as walking sticks and umbrella handles. Carbon farming - Industrial Crop: biomass. Fodder: bank. Other Systems: multistrata.

dwatta Antiemetic AntirheumaticThe leaves are used in the treatment of arthritic inflammations[218]. The sheaths of the stem are used in the treatment of nausea and sour stomach[218].

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Industrial Crop: Biomass Management: Managed Multistem Minor Global Crop Other Systems: MultistrataRequires a rich damp soil in a sheltered position[200] with plenty of moisture in the growing season[162]. Likes abundant sunshine[11]. A fairly cold-hardy plant, succeeding outdoors in many areas of Britain. It tolerates temperatures down to about -15°c according to one report, but the plants are slow to recover from damage caused by cold weather[11]. They also dislike prolonged exposure to hard frosts[200]. Plants grow well in Cornwall making a very good sized clump. The young shoots are very fast growing, up to 30cm per day[11], and are produced from late April[25]. The rootstock is running but it is practically static in cool climates[25]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. Young plants can be difficult to establish, new plantings only grow slowly at first and often fail completely if soil and water conditions are less than the best[195]. This species, but especially its cultivar 'Pubescens'[266] is extensively cultivated for its edible young shoots and other uses in China and Japan[46, 183, 266], it is the most commonly cultivated bamboo in China and the second most common in Japan[195]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. Carbon Farming - Cultivation: minor global crop. Management: managed multistem.

## 7.2.24 Actinidia chinensis

Kiwi

6 tlin 9 cyuc 4 kcaak 2 tcan 2 dwat 7.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Actinidia chinensis is a deciduous Climber growing to 7.5 m (24ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked. A delicious flavour. The fruit is up to 3cm across[198]. Fresh fruits contain 100 - 420mg vitamin C per 100g and 8 - 14% carbohydrate[218]. Acidity is 1 - 2%, mainly citric acid[218]. The fruit contains a number of small seeds, but these are easily eaten with the fruit[K]. The leaves are eaten cooked in times of need as a famine food[179].

tcanta Insecticide Paper PencilPaper is made from the bark[178]. If the bark is removed in one piece from near the root and placed in hot ashes, it becomes very hard and can be used as a tube for a pencil[178]. The plant is said to have insecticidal properties (no more details)[218].

dwatta Diuretic Febrifuge Sedative Urinary Vitamin CThe fruits, stems and roots are diuretic, febrifuge and sedative[147]. They are used in the treatment of stones in the urinary tract, rheumatoid arthralgia, cancers of the liver and oesophagus[147]. A decoction of the leaves is used to treat mange in dogs[218]. The stem-juice is used in the treatment of gravel[218].

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°c, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. The dormant plant is hardy to about -15°c[184], though new growth in spring is very susceptible to frost damage[11]. This species is the parent of the cultivated Kiwi fruits, these cultivars are now included under the name *A. deliciosa*[200]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. The flowers are sweetly scented[245]. This is a climbing plant, supporting itself by twining around branches etc[200]. The ssp. *A. chinensis setosa* (newly named, no author as yet) is found in Taiwan from 1300 - 2600m[198]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.25 Phyllostachys viridiglaucescen

Greenwax golden bamboo

6 tlin 9 cyuc 4 kcaak 1 tcan 0 dwat 6 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys viridiglaucescens is an evergreen Bamboo growing to 6 m (19ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

ckakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked[61, 105, 177]. Virtually free of acidity even when raw[195], they are eaten in salads or added to soups etc[183]. The shoots on mature clumps can be 40mm or more in diameter[K]. Another report says the shoots are acrid when raw. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta Plant supportThe canes are used as plant supports etc[61, 195].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow

Winter savory is often grown in the garden as a culinary herb, there are some named varieties[183]. The flavour is said to be more coarse than that of the annual savory (*S. hortensis*). The plants live for several years, but as they grow older they do not make so much new growth and so are best replaced every two years[4].

## 7.2.55 Brassica juncea tumida

Swollen-Stem Mustard

6 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica juncea tumida is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Flowers Leaves Oil StemEdible Uses: Condiment OilLeaves and leaf stems - raw or cooked[22, 33, 46, 52, 61]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[206]. The leaves can also be finely shredded and added to mixed salads[206]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[183]. Flowers and young flowering stems - raw or cooked[52]. Sweet and succulent[133]. An edible semi-drying oil is obtained from the seed[1, 2, 17, 57, 183]. The seed contains 25 - 30% oil[74]. The seed is used as a mustard flavouring[171]. It is the source of 'brown mustard'[183], a prepared mustard that is milder than that produced from other species[238]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[238]. They are often heated in oil to destroy their pungency and give them a nutty flavour[238]. Sprouted seeds can be added to salads. Plants produce swellings on the stem, these can be cooked or pickled[206].

tcanta Green manure Oil RepellentThere is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[206]. This is attributed to chemicals that are given off as the plants decay[206].

dwatta Anodyne Aperient Diuretic Emetic Galactogogue Rubefacient StimulantReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[269]. The seed is used in the treatment of tumours in China[269]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[269]. The root is used as a galactagogue in Africa[269]. Ingestion may impart a body odour repellent to mosquitoes[269]. Mustard oil is used in the treatment of skin eruptions and ulcers[269]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[269]. In Java the plant is used as an antisyphilitic emmenagogue[269]. Leaves applied to the forehead are said to relieve headache[269]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[269].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[206]. It is best not to sow the seed in very hot weather[206]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[269].

nwatta Succeeds in full sun in most well-drained moisture-retentive fertile soils[16, 200, 206]. Prefers a heavy soil and some shade[16]. Dislikes very hot weather[33]. Plants tolerate high rainfall and, although fairly deep rooted, are not very drought resistant[206]. A form of *B. juncea* that has been selected in the Orient for its edible swollen stem, there are many named varieties[206]. Plants are reasonably

cold-tolerant[206]. They prefer a fairly high stable temperature and are well adapted to short day length[200]. Many are best grown in warmer climates than Britain but there are several cultivars that grow well in this country[206]. Plants have a rooting depth of between 90 - 120 cm[269]. A good bee plant[74].

## 7.2.56 Brassica juncea integrifolia crispifolia

Curled Mustard

6 tlin 10 cyuc 4 kcaak 2 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Brassica juncea integrifolia crispifolia is a ANNUAL growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. The flowers are pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Flowers Leaves Seed Shoots Stee Uses: CondimentLeaves - raw or cooked[ 22 , 33 , 46 , 52 , 61 ]. A peppery flavour that can range from mild to hot, this is one of the most highly prized cooked vegetables in the Orient[ 206 ]. The leaves can also be finely shredded and added to mixed salads[ 206 ]. The protein extracted from the leaves mixes well with banana pulp and is well adapted as a pie filling[ 183 ]. Flowers and young flowering stems - raw or cooked[ 52 ]. Sweet and succulent[ 133 ]. An edible semi-drying oil is obtained from the seed[ 1 , 2 , 17 , 57 , 183 ]. The seed contains 25 - 30% oil[ 74 ]. The seed is used as a mustard flavouring[ 171 ]. It is the source of 'brown mustard'[ 183 ], a prepared mustard that is milder than that produced from other species[ 238 ]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[ 238 ]. Black mustard comes from *B. nigra* and white mustard from *Sinapis alba*. The seed is also used whole in curries and pickles[ 238 ]. They are often heated in oil to destroy their pungency and give them a nutty flavour[ 238 ]. Sprouted seeds can be added to salads.

tcanta Green manure Repellent Soil reclamation TeethOther uses rating: Low (2/5). Agroforestry Uses: There is some evidence that if this plant is grown as a green manure it is effective in reducing soil-borne root rots in pea crops[ 206 ]. This is attributed to chemicals that are given off as the plants decay[ 206 ]. Other Uses None known

dwatta Anodyne Antiarthritic Antiinflammatory Antirheumatic Antitumor Aperient Diuretic Emetic Galactogogue Laxative Rubefacient Skin Stimulant TonicReported to be anodyne, aperitif, diuretic, emetic, rubefacient, and stimulant, the plant is a folk remedy for arthritis, foot ache, lumbago, and rheumatism[ 269 ]. The seed is used in the treatment of tumours in China[ 269 ]. In Korea, the seeds are used in the treatment of abscesses, colds, lumbago, rheumatism, and stomach disorders[ 269 ]. The root is used as a galactagogue in Africa[ 269 ]. Ingestion may impart a body odour repellent to mosquitoes[ 269 ]. Mustard oil is used in the treatment of skin eruptions and ulcers[ 269 ]. Believed to be aperient and tonic, the volatile oil is used as a counterirritant and stimulant[ 269 ]. In Java the plant is used as an antisyphilitic emmenagogue[ 269 ]. Leaves applied to the forehead are said to relieve headache[ 269 ]. The Chinese eat the leaves in soups for bladder, inflammation or haemorrhage[ 269 ].

propta Seed - sow in situ from August to October. Spring and early summer-sown crops tend to run quickly to seed, though they can be eaten whilst still small[ 206 ]. It is best not to sow the seed in very hot weather[ 206 ]. There are about 5,660 - 6,000 per 0.01 kg (1/3 oz)[ 269 ].

nwatta A form of *B. juncea* with curled leaves that has been selected in the Orient for its edibility. There are some named varieties[ 206 ]. Very hardy in cold weather, it is used more in temperate areas than in tropical ones. Succeeds in



smelting[82]. The wood has a high combustibility and burns well[257]. It gives off a pleasant aroma as it burns[257].

dwatta Antiseptic Contraceptive Diuretic Laxative Plaster Poultice Salve Skin VermifugeSingle leaf piñon was employed medicinally by several native North American Indian tribes who valued it especially for its antiseptic and vulnerary properties and also for its beneficial effect on the respiratory system[257]. It is little, if at all, used in modern herbalism. The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy in the treatment of kidney and bladder complaints, and is used both internally and externally to treat rheumatic affections[4, 257]. It is also used in treating diseases of the mucous membranes, respiratory complaints, VD, TB, coughs, colds and influenza[4, 257]. A decoction is used to rid the body of tapeworms and other internal parasites[257]. Externally it is used in the form of liniment plasters and inhalers[4]. A poultice of the melted gum has been applied to cuts and sores[257]. The heated pitch has been applied to the face as a depilatory[257]. The pitch has also been used as a face cream to prevent sunburn[257]. The heated pitch has been used as a poultice to treat sciatic pains and muscular soreness[257]. The cooked pitch has been used by women to stop menstruation and thereby become infertile[257]. It has also been given to adolescent girls to help them keep youthful and live a long life[257]. The gum is used as a plaster on sores and cuts[216].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Management: Standard Staple Crop: Protein-oil Wild Staple CropLandscape Uses:Specimen, Woodland garden. Thrives in a light well-drained sandy or gravelly ground[1, 11]. Succeeds in a hot dry position[200]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. A slow growing tree in the wild, taking 25 years from sowing until it produces a crop[117]. It then usually produces cones annually, with heavy crops very 2 - 3 years[229]. The tree is long-lived, taking 250 - 350 years to reach maturity[181]. It grows well in southern England[120] and in most of the drier parts of Britain[11]. The cones take 2 summers to mature[229], they open and shed their seed whilst still attached to the tree[226]. Closely related to *P. cembroides* and considered to be no more than a sub-species of it by some botanists[11]. The main difference is that this species has its leaves singly whilst *P. cembroides* has them in groups of two or three[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow beneath the tree[18]. Plants in this genus are notably susceptible to honey fungus[200]. Special Features: North American native, Inconspicuous flowers or blooms.

## 7.2.54 Satureja montana

Winter Savory

6 tin 11 cyuc 4 kcaak 4 tcan 3 dwat 6 hkuc htuc cyuti hgatkuyctcup hwicli hyishrasjut hpa7tli flatprikwisslip hpa7tmwatli xre7t hjonli

drutta Satureja montana is an evergreen Shrub growing to 0.4 m (1ft 4in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is

not frost tender. It is in leaf all year, in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: LeavesEdible Uses: Condi-ment TeaLeaves - raw or cooked[2, 4, 9, 20, 34, 37, 52]. A peppery flavour, they are used mainly as a flavouring for cooked foods, especially beans, and also as a garnish for salads etc[183]. Plants are very hardy, tolerating temperatures down to about -20°C[195], but they dislike prolonged exposure to hard frosts[200]. Plants can reach 10 metres in height in the warmer parts of Britain. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. A very ornamental plant, it will in time form a clump 7 or more metres in diameter so it is best grown in an isolated position[11]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. The rootstock is running[25], it is not too invasive in the cooler British climate[200] but can wander a little. New shoots appear from early April[25]. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

tcanta Companion Essential RepellentThe growing plant repels insects[18, 20, 201]. An essential oil is obtained from the leaves. Plants can be grown as a ground cover when spaced about 45cm apart each way[208]. A good bee plant[200]. The leaves have an aromatic fragrance[245]. A good companion plant to grow in the garden, it does especially well with onions and beans and helps to repel insect pests[201]. The plant is said to inhibit the germination of certain seeds[18]. Winter savory seeds can prevent the germination of nearby seeds[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Attractive foliage, Edible, Fragrant foliage, Not North American native. Dynamic accumulator.

dwatta Antiseptic Aromatic Carminative Digestive Expectorant Stings StomachicWinter savory is most often used as a culinary herb, but it also has marked medicinal benefits, especially upon the whole digestive system[254]. The plant has a stronger action than the closely related summer savory, *S. hortensis*[254]. The whole herb, and especially the flowering shoots, is mildly antiseptic, aromatic, carminative, digestive, mildly expectorant and stomachic[4, 7, 9, 14, 21]. Taken internally, it is said to be a sovereign remedy for colic and a cure for flatulence[4], whilst it is also used to treat gastro-enteritis, cystitis, nausea, diarrhoea, bronchial congestion, sore throat and menstrual disorders[9, 238]. It should not be prescribed for pregnant women[238]. A sprig of the plant, rubbed onto bee or wasp stings, brings instant relief[4, K]. The plant is harvested in the summer when in flower and can be used fresh or dried[238]. The essential oil forms an ingredient in lotions for the scalp in cases of incipient baldness[7]. An ointment made from the plant is used externally to relieve arthritic joints[7].

propta Seed - surface sow in April in a greenhouse. Do not allow the compost to dry out. Germination can be slow and erratic[1] but usually takes place within a month[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle. It is usually possible to plant out into their permanent positions during the summer, but if the plants have not grown sufficiently, or if you live in an area of cold winters, it might be best to grow them in a cold frame for their first winter and plant them out in late spring or early summer of the following year[K]. Cuttings of half-ripe wood, 5 - 8cm taken at a node, July/August in a frame. Pot up in autumn and overwinter in a frame, planting out in late spring or early summer of the following year. A high percentage usually succeed[78]. Cuttings of young wood, preferably with a heel, April/May in a frame[1, 37]. Plant out in the summer if the plants grow well, otherwise overwinter them in a cold frame and plant out in late spring or early summer of the following year[K]. Division in early spring as growth commences[78, 200]. This works best if soil has been mounded up into the bottom 20cm of the plant early in the previous summer[78]. Pot up the divisions and grow them on in a cold frame until they are established. Plant them out in the summer.

nwatta Landscape Uses:Alpine garden, Border, Rock garden, Specimen. An easily grown plant when given suitable conditions, it prefers a well-drained poor stony soil[4, 14, 27, 52] and succeeds in a hot dry sunny position[200]. It prefers an alkaline soil[200] though it is not too fussy. It is very intolerant of soils that remain damp, especially in the winter, and dislikes shade[200]. Plants are less hardy when they are grown in rich soils and also in wet conditions[4, K].

on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position[200] and plenty of moisture in the growing season[200]. Plants are very hardy, tolerating temperatures down to about -20°C[195], but they dislike prolonged exposure to hard frosts[200]. Plants can reach 10 metres in height in the warmer parts of Britain. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. A very ornamental plant, it will in time form a clump 7 or more metres in diameter so it is best grown in an isolated position[11]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. The rootstock is running[25], it is not too invasive in the cooler British climate[200] but can wander a little. New shoots appear from early April[25]. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.26 Phyllostachys nigra punctata

Kurodake

6 tin 9 cyuc 4 kcaak 0 tcan 3 dwat 6 m hkuc hmim cyuti tcup hwicli hrasjutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys nigra punctata is an evergreen Bamboo growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: StemEdible Uses: Young shoots - cooked. Somewhat acid, they are prepared for eating by boiling in one change of water, the water being changed after 8 - 10 minutes. A distinctive taste and aroma. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta Basketry Plant supportThe canes make good plant supports. The rhizome is used in making umbrella handles, wickerwork, canes etc.

dwatta Antiemetic Depurative Diuretic Expectorant Febrifuge SedativeThe leaves are antipyretic and diuretic[218]. They are used internally in the treatment of fevers (especially infantile convulsions), vomiting and nosebleeds[238]. The leave are harvested during the growing season and dried for later use[238]. The juice of the stems is antipyretic, antitussive, expectorant and sedative[147, 176, 218]. It is taken internally in the treatment of lung infections

with cough and phlegm[238]. The sap is pressed from young stems in the summer and then dried for later use[238]. The epidermis of the stem bark is antiemetic and sedative[147, 176, 218]. It is used internally in the treatment of vomiting, nosebleeds, coughs etc[238]. The epidermis is collected from young stems in the summer and is dried for later use[238]. The root is astringent, antipyretic, depurative, diuretic and stypitic[147, 176, 218]. It has been used in the treatment of rabies[147, 238]. A decoction is also used in the treatment of high fevers and nocturnal fretfulness in infants[147]. The roots are harvested in the winter and dried for later use[238].

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position[200] and plenty of moisture in the growing season[1]. A very hardy plant, tolerating temperatures down to at least -7°C, but it dislikes prolonged exposure to hard frosts[200]. A very ornamental plant[1], this form of *P. nigra* is often grown for food and ornament. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. The plant has a running rootstock, though not aggressively so in the cooler climate of Britain[200], and it produces new shoots from May[25]. Dead stems can be removed at any time of the year[238]. It is also possible to thin the clumps in spring, leaving only the strongest stems and thus creating an open grove-like effect[238]. Cultivated for its edible young shoots in China[61]. This species has been widely planted for ornament in the Mediterranean and is becoming established[50].

## 7.2.27 Phyllostachys nigra henonis

Ha-Chiku

6 tin 9 cyuc 4 kcaak 0 tcan 3 dwat 6 m hkuc hmim cyuti tcup hwicli hrasjutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys nigra henonis is an evergreen Bamboo growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: StemEdible Uses: Young shoots - cooked[25, 46, 105, 177]. Somewhat acid when raw[61], they are prepared for eating by boiling in one change of water, the water being changed after 8 - 10 minutes[183]. A distinctive taste and aroma[183]. The shoots, which are about 5cm in diameter[266], are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta Basketry Hedge Hedge Plant supportThe canes make good plant supports. Thin walled but durable, the canes are also used for cabinet work and for decorative panels and inlays[195]. The rhizome is used in making umbrella handles, wickerwork, canes, musical instruments and various kinds of handicrafts[25, 74].

dwatta Antiemetic Depurative Diuretic Expectorant Febrifuge SedativeThe leaves are antipyretic and di-

uretic[218]. They are used internally in the treatment of fevers (especially infantile convulsions), vomiting and nosebleeds[176, 238]. The leave are harvested during the growing season and dried for later use[238]. The juice of the stems is antipyretic, antitussive, expectorant and sedative[147, 176, 218]. It is taken internally in the treatment of lung infections with cough and phlegm[238]. The sap is pressed from young stems in the summer and then dried for later use[238]. The epidermis of the stem bark is antiemetic and sedative[147, 176, 218]. It is used internally in the treatment of vomiting, nosebleeds, coughs etc[238]. The epidermis is collected from young stems in the summer and is dried for later use[238]. The root is astringent, antipyretic, depurative, diuretic and styptic[147, 176, 218]. It has been used in the treatment of rabies[147, 238]. A decoction is also used in the treatment of high fevers and nocturnal fretfulness in infants[147]. The roots are harvested in the winter and dried for later use[238].

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Requires a rich damp soil in a sheltered position[200] and plenty of moisture in the growing season[1]. A very hardy plant, tolerating temperatures down to at least -7°c, but it dislikes prolonged exposure to hard frosts[200]. Another report says that it tolerates temperatures down to about -20°c[195]. A very ornamental plant[1], this is the form of *P. nigra* that is most commonly met in the wild. It is believed that this form is the true wild form and that the species is in fact a garden cultivar. However, since that form was the first to be named botanical etiquette demands that this form is treated taxonomically as a cultivar[195]. It is this form 'Hennonis' that is used medicinally in China[176]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. This species is notably resistant to honey fungus[200]. The plant has a running rootstock, though not aggressively so in the cooler climate of Britain[200]. and it produces new shoots from May[25]. Dead stems can be removed at any time of the year[238]. It is also possible to thin the clumps in spring, leaving only the strongest stems and thus creating an open grove-like effect[238]. Cultivated for its edible young shoots in China[61]. This species has been widely planted for ornament in the Mediterranean and is becoming established[50].

## 7.2.28 Prunus laurocerasus

Cherry Laurel, English Laurel

6 tlin 8 cyuc 4 kcaak 5 tcan 3 dwat 6 m hkuc pcmihmhmtut cyutli tcup hwicli hrasljutnykfrip hpa7tli flatprkhwia hpa7tmwatli xre7t hjonli

drutta *Prunus laurocerasus* is an evergreen Shrub growing to 6 m (19ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to June, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-

shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcaakta Edible Parts: Fruit SeedEdible Uses: Condi- mentFruit - raw or cooked. Sweet and reasonably pleasant when fully ripe[65, 74, K]. The cultivar 'Camellifolia' bears huge quantities of fruit[K]. This is the size of a large cherry and, when fully ripe, has a reasonable flavour raw with a jelly-like texture and a slight astringency[K]. Some sources suggest the fruit is poisonous, this probably refers to the unripe fruit[7]. We have eaten this fruit in quite large quantities without the slightest ill effects (this also includes a 2 year old child) and so any toxicity is of a very low order[K]. However, any fruit that is bitter should not be eaten in quantity because the bitterness is caused by the presence of the toxic compounds - see the notes above on toxicity. The fruit is about 8mm in diameter and contains one large seed[200]. Water distilled from the leaves is used as an almond flavouring[2, 46, 61, 183]. It should only be uses in small quantities, it is poisonous in large amounts[183]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

tcanta Cleanser Dye Essential Hedge Hedge WoodVery tolerant of trimming, this plant makes an excellent hedge especially in shady areas[11, 29, 200]. Some forms of this plant, notably 'Cherry Brandy', 'Otto Luyken', 'Zabelina' and 'Schipkaensis' are low-growing and make very good ground cover plants for sun or shade[182, 197]. Water distilled from the leaves is used in perfumery[4]. The bruised leaves, when rubbed within any container, will remove strong odours such as garlic or cloves so long as any grease has first been fully cleaned off[4]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168]. Wood - pinkish grey. Used in turnery and lathe work[74].

dwatta Antispasmodic Narcotic Ophthalmic Seda- tiveThe fresh leaves are antispasmodic, narcotic and sedative[4, 7]. They are of value in the treatment of coughs, whooping cough, asthma, dyspepsia and indigestion[4, 238]. Externally, a cold infusion of the leaves is used as a wash for eye infections[238]. There are different opinions as to the best time to harvest the leaves, but they should only be used fresh because the active principles are destroyed if the leaves are dried[4]. Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

propta Seed - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Cuttings of mature wood, October in a sheltered north facing border outdoors[113]. Layering in spring.

nwatta Landscape Uses:Border, Screen, Specimen. Requires a well-drained moisture retentive soil[1, 11]. Grows well in heavy clay soils. Thrives in a loamy soil, doing well on limestone[11]. Prefers some chalk in the soil but it is apt to become chlorotic if too much is present, growing badly on shallow chalk[98, 200]. Extremely tolerant of shade, it succeeds in the dense shade of trees with almost no direct light and in their drip line[197, 200], though it fruits better in a more sunny position[200]. A very ornamental plant, there are many named varieties[200]. The cultivar 'Otto Luyken' is a low growing narrow-leaved form that flowers in spring and autumn. The tiny flowers are powerfully fragrant[245] but have a rather offensive odour[182]. This is a matter of opinion, some people find the smell sweet and delightful[K]. A greedy plant, inhibiting the growth of nearby plants[11], it should be introduced with care since it often self-sows in woodlands and can prevent the successful regeneration of native trees by shading out the seedlings[208]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. The flowers attract butter-

has been used as a black pigment in dyes[269]. The stem has been used as a base for drilling fire[269].

dwatta Antibilious Aphrodisiac Dysentery Poul- ticePurgativeThe juice of the flowers, mixed with sugar and black pepper, is used in the treatment of biliousness with acidity[240]. The seeds are aphrodisiac[240]. They are added to the diet in order to promote weight increase[240]. Externally, they are used as a poultice on pains and bruises[240]. The leaves are purgative[240]. An infusion of the leaves is used in the treatment of coughs[269]. In Ayurvedic medicine, the leaves are used in the treatment of dysentery and bilious, blood and throat disorders. The powdered leaves are applied to Guinea worms in Africa[269]. The peelings from the stems have been used in the treatment of anaemia, fatigue, lassitude, etc[269].

propta Seed - sow early spring in a warm greenhouse. Germination is usually fairly rapid. Prick out the seedlings into individual pots when they are large enough to handle. If growing them as annuals, plant them out into their permanent positions in early summer and protect them with a frame or cloche until they are growing away well. If hoping to grow them as perennials, then it is better to grow them on in the greenhouse for their first year and to plant them out in early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Overwinter them in a warm greenhouse and plant out after the last expected frosts.

nwatta Prefers a well-drained humus rich fertile soil in full sun[200]. Tolerates most soils but prefers a light sandy soil[123]. Plants are adapted to a wide range of soils and climatic conditions[171]. Kenaf is reported to tolerate an annual precipitation in the range of 57 to 410cm, an annual temperature range of 11.1 to 27.5°c and a pH in the range of 4.3 to 8.2 (though it prefers neutral to slightly acid)[269]. The plant is frost sensitive and damaged by heavy rains with strong winds[269]. Kenaf is widely cultivated in tropical and sub-tropical areas of the world, where it is grown mainly as a fibre crop but also for its seeds and leaves[269]. It is very hardy outdoors in Britain, it really requires a frost free climate[123]. It can, however, probably be grown as an annual. A fast-growing plant, it can be harvested in 3 - 4 months from seed[50, 61]. The plant requires temperatures in the range of 15 - 25°c[169]. It succeeds as a crop as far north in N. America as Indiana, Iowa, Kansas and Nebraska[160]. Plants are daylight sensitive, they remain vegetative and do not flower until the daylength is less than 12.5 hr/day. Two weeks of very cloudy days will induce flowering as daylength approaches 12.5 hr[269]. The plant has a deep-penetrating taproot with deep-seated laterals[269]. Plants, including any varieties, are partially self-fertile[269].

## 7.2.52 Allium ramosum

Chinese Chives

6 tlin 9 cyuc 4 kcaak 0 tcan 2 dwat 0.5 m hkuc htut cyutli kyuctuc hwicli hrasljut hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta *Allium ramosum* is a BULB growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked. The small bulbs are about 10mm in diameter[200]. Leaves - raw or cooked. The flavour is somewhat between that of garlic and chives[183]. An excellent taste, the leaves have a pleasant sweetness mixed with a strong onion flavour[K]. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta DysenteryThe leaves and bulbs contain sulphur compounds (which give them their onion flavour), saponins and bitter substances[283]. They possess antibacterial properties and are used in Vietnam in the treatment of haemoptysis, epistaxis, cough, sore throat, asthma, dysentery, dyspepsia etc[283]. When added to the diet on a regular basis

they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K]. The seed contains alkaloids and saponins[283]. It is used in the treatment of spermatorrhoea, haematuria, incontinence, lumbago etc[283].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required.

nwatta An easily grown plant[203], it prefers a sunny position in a light well-drained soil[1, 42]. The bulbs should be planted fairly deeply[1]. A very ornamental plant, the flowers are especially attractive. Very closely related to *A. tuberosum*[42, 90, 203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.53 Pinus monophylla

Single Leaf Piñon, Single Leaf PinyonPine, Stone Pine, Pine Pinyon

6 tlin 8 cyuc 4 kcaak 5 tcan 2 dwat m hkuc htut cyutli hgatkyuctuc hwicli hyishrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta *Pinus monophylla* is an evergreen Tree growing to 10 m (32ft 10in) at a slow rate.It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: CondimentSeed - raw or cooked[1, 82, 161, 257]. Oily, with an agreeable almond-like flavour[2, 229]. They are often used in sweetmeats, pastries, etc. They are the lowest in protein and fats and the highest in starch of the piñons[183, 200]. The seeds are an important food source for the local Indians of Nevada and California[82]. A good size, the seed is up to 20mm long[200] and has a thin shell[229]. The pitch obtained from the trunk is allowed to harden and is then used as a chewing gum[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Adhesive Dye Fuel Herbicide Pitch Plaster Roof- ing WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The gum (this almost certainly means the resin[K]) is used in water-proofing canoes, baskets, water containers etc, for repairing pottery vessels and in making turquoise mosaic[216]. It is also used as an adhesive for mending pottery[257]. The bark has been used as a roofing material in houses[257]. Wood - light, soft, weak and brittle[82]. Used primarily for fuel and fence posts[229]. It is also made into charcoal and used for

days after emergence, depending on cultivar and ecological conditions[141

, 183  
, 299  
, 418

] The seed is harvested when most of it (at least 75%) is mature, and most leaves have yellowed and dropped. The crop is harvested by mowing, after which the stems are bundled and put in heaps to dry. Farmers prefer to harvest early in the morning or late in the afternoon, or even at night, when the plants are slightly damp from dew, to reduce grain shattering[299

] The average seed yield in the United States is 0.9 - 1 tonne per hectare; in Kenya, it is 1 tonne, and in Russia 1 - 1.3 tonnes; but up to 4 tonnes can be obtained[418

] The seed ripens irregularly over a period of several weeks, so it is difficult to harvest[141

] Plants have poor frost resistance, but they are disease and insect resistant[166

] They inhibit the growth of winter wheat[118

, 20  
, 201

] There are some named varieties[183

] The flowers have a pleasant sweet honey scent[245

] and are extremely attractive to bees and hoverflies[4

, 171  
, 1

## 7.2.50 Asphodeline lutea

King's Spear, Yellow Asphodel, Jacob's Rod

6 tin 9 cyuc 4 kcaak 2 tcan 0 dwat 1 m hkc

hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Asphodeline lutea is a PERENNIAL growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Root - roasted. This food was highly valued by the ancient Greeks, who roasted the roots like potatoes and ate them with salt and oil or mashed them with figs[2, 183]. The roots are not very thick but are abundantly produced and have a nice nutty flavour[K]. They can be harvested at any time of the year, but are best used when the plant is dormant in late summer and early autumn[K]. They do not store well and should be used within a few weeks of harvest[K]. Young shoots - cooked[K]. They smell less than pleasant whilst cooking but have a fairly bland flavour[K]. Some people find that they have a very pleasant flavour[K]. The plant comes into growth in late summer and the autumn, the young shoots can be harvested in moderation all through the winter[K]. Flowers - raw. A delightful sweetness, they are a very decorative and tasty addition to the salad bowl but should be used as soon as possible after harvesting because they soon start to decompose[K]. The flowers are very short-lived and are best picked in the late afternoon - thus you can enjoy them visually during the day and gastronomically in the evening[K]. There is also said to be a double-flowered form[245], which will have twice the quantity of petals, though we do not know its name[K].

tcanta Scented plant. Attractive edible flowers.

dwatta None known

propta Seed - sow March/April in a greenhouse and only just cover the seed. Germination usually takes place in 1 - 3 months at 15°C[134]. Once the seedlings are large enough to handle, prick them out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring. Division in spring or autumn, with care since the roots are easily damaged[1]. Ensure each division has at least one growing bud[200]. Large divisions can be planted out straight into their permanent positions, smaller ones are best potted up until they are growing away strongly and can then be panted out. We have found

that this plant can be successfully divided throughout the growing season so long as it is watered in dry weather[K].

nwatta Landscape Uses:Container, Foundation, Massing. An easily grown plant, it succeeds in ordinary garden soil[1, K], tolerating partial shade[200]. Requires a well-drained soil[42, 134], doing well in sandy soils[188]. Prefers a deep rich soil[111]. Prefers a soil that is not too rich and a warm sunny position[200]. Plants are hardy to about -15°C[187]. A very ornamental plant[1], though it looks very untidy in late summer when it dies down after flowering[K]. It seems to be very wind resistant, tolerating maritime exposure on an exposed site in Cornwall[K]. The flowers are sweetly scented[245]. Plants seem to be immune to the predations of rabbits[233]. Special Features:Attractive foliage, Naturalizing, Suitable for dried flowers, Fragrant flowers. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 7.2.51 Hibiscus cannabinus

Kenaf, Brown Indianhemp

6 tin 12 cyuc 4 kcaak 3 tcan 2 dwat 1.8 m hkc

htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta Hibiscus cannabinus is a ANNUAL/PERENNIAL growing to 1.8 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 10 and is frost tender. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil Root See Uses: Condiment Oil OilYoung leaves - cooked[74, 105, 177]. Used as a potherb or added to soups[183]. The leaves have an acid flavour like sorrel[2]. Seed - roasted or ground into a flour and made into a kind of cake[105, 177, 183]. Root - it is edible but very fibrous[144]. Mucilaginous, without very much flavour[144]. An edible oil is obtained from the seed[61, 183]. The yield varies from 2 - 10 tonnes per hectare[74] (or is it per acre?).

tcanta Dye Fibre Friction sticks Oil Oil Paper Plant support Soap making Soil reclamation StringAgroforestry Uses: Kenaf plants accumulate minerals such as selenium and boron, and can be used as a bioremedial tool for removing these metals from contaminated soil[299, 1519]. Yields a fibre from the stem[1, 123], a very good jute substitute though it is a bit coarser[61]. The fibre strands, which are 1.5 - 3 metres long, are used for making rope, cordage, canvas, sackings, carpet backing, nets, table cloths etc[74, 123, 269]. For the best quality fibre, the stems should be harvested shortly after the flowers open[171, 269]. The best fibre is at the base of the stems, so hand pulling is often recommended over machine harvesting[269]. Yields of about 1.25 tonnes of fibre per hectare are average, though 2.7 tonnes has been achieved in Cuba[74, 269]. The pulp from the stems has been used in making paper[269]. The seed contains between 18 and 35% of an edible semi-drying oil[61, 74]. It is rather similar to groundnut oil, obtained from *Arachis hypogaea*[240]. The oil is also used for burning, as a lubricant and in making soap, linoleum, paints and varnishes[46, 61, 74, 269]. The seed yield varies from 2 to 10 tonnes per acre[74] (or is it per hectare?). The stems have been used as plant supports for growing runner beans etc[269]. The soot from the stems

flies and moths[30]. This species is notably resistant to honey fungus[88, 200]. Subject to bacterial canker which can kill large branches[124]. Trim (preferably with secateurs) in spring or late summer[200]. Old plants can be cut back hard into the old wood in spring and will soon recover[200]. Special Features:Not North American native, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms.

## 7.2.29 Ficus carica

Fig, Edible fig, Fig Common

6 tin 10 cyuc 4 kcaak 2 tcan 2 dwat 6 m hkc

htut cyutli hgtakuyctcup hwicli hyishrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyif hjonli

drutta Ficus carica is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to September, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit SapEdible Uses: Curdling agentFruit - raw or cooked[1, 3, 3, 4, 46]. Sweet and succulent, a fully ripe specimen is an exquisite fruit that almost literally melts in the mouth[K]. The fruit is often dried for later use[183] and this dried fruit is a major item of commerce. Figs are usually pear-shaped and up to 5cm in diameter[200]. A nutritional analysis is available[218]. The latex from the sap can be used to coagulate plant milks[183].

tcanta Landscape Uses: Container, Espalier, Specimen. Wood - pliable but porous and of little value[4, 89]. It is used for hoops, garlands, ornaments etc[89]. When saturated with oil and covered with emery is used as a substitute for a hone[4].

dwatta Cancer Demulcent Digestive Emollient Galactagogue Laxative Pectoral Stings Stomachic Tonic WartsA decoction of the leaves is stomachic[218]. The leaves are also added to boiling water and used as a steam bath for painful or swollen piles[218]. The latex from the stems is used to treat corns, warts and piles[4, 89, 218]. It also has an analgesic effect against insect stings and bites[7]. The fruit is mildly laxative, demulcent, digestive and pectoral[4, 7, 218]. The unripe green fruits are cooked with other foods as a galactagogue and tonic[218]. The roasted fruit is emollient and used as a poultice in the treatment of gumbolls, dental abscesses etc[4]. Syrup of figs, made from the fruit, is a well-known and effective gentle laxative that is also suitable for the young and very old[254, K]. A decoction of the young branches is an excellent pectoral[7]. The plant has anticancer properties[218].

propta Seed - sow spring in a warm greenhouse. Prick out the seedlings as soon as they are large enough to handle and overwinter the young plants in a greenhouse for at least their first year. Plant out in late spring after the last expected frosts and give some protection for their first winter outdoors. Cuttings of mature wood 10 - 12cm with a heel, winter in a frame. Fairly easy, but the cuttings must be kept frost free. It is probably best if the cuttings are put in individual pots[78]. Layering.

nwatta Figs are plants of temperate and subtropical climates. They do not generally grow well in the wet tropics, but can be grown at higher elevations in the drier to moist tropics[418

] The fruits develop best when plants are grown in relatively dry climates where a cool-season alternates with a hot season[335

] They grow best in areas where annual daytime temperatures are within the range of 16 - 26°C, but can tolerate 4 - 38°C[418

] Dormant plants are hardy to about -15°C[202

] The top growth is susceptible to frost damage and can be killed back to the base in severe winters, though plants usually recover well[3

] They prefer a mean annual rainfall in the range 700 - 1,500mm, but tolerate 300 - 2,700mm[418

] Prefers a very sunny position but tolerates part-day shade when grown on a warm wall[202

] Requires a well-drained medium to light loam and some lime rubble incorporated into the soil[1

] Succeeds in dry soils. A heavy wet soil tends to encourage excessive plant growth at the expense of fruit production[1

] Prefers a pH in the range 6 - 7, but tolerates 4.3 - 8.6[418

] Seedling trees can commence cropping when only 3 - 4 years old, whilst cuttings can start fruiting in only 1 - 2 years[335

] Up to three crops of fruit a year can be obtained in some countries[46

] Trees have been known to live for as long as 200 years[418

] There are many named varieties[183

, 301

] There are two primary types of fig:- the Adriatic fig which produces fruit without pollination; and the Symrna fig that require the presents of a fig wasp for pollination[418

] It is a good idea to restrict the roots of fig trees on most soil types in order to discourage excessive vegetative growth at the expense of fruit production[3

] This can be done by root pruning, but it is easier to place some kind of permanent restriction around the roots - planting into a large tub that is then buried into the ground is one method. It is important to make sure that the tree still gets ample moisture, especially when the fruits are ripening. Fig trees have a unique form of fertilization, each species relying on a single, highly specialized species of wasp that is itself totally dependant upon that fig species in order to breed. The trees produce three types of flowers; a male, a long-styled female and a short-styled female flower, often called the gall flower. All three types of flowers are contained within the structure we usually think of as the fruit. The female fig wasp enters a fig and lays its eggs on the short styled female flowers while pollinating the long-styled female flowers. Wingless male fig wasps emerge first, inseminate the emerging females and then bore exit tunnels out of the fig for the winged females. Females emerge, collect pollen from the male flowers and fly off in search of figs whose female flowers are receptive. In order to support a population of its pollinator, individuals of a *Ficus* spp. must flower asynchronously. A population must exceed a critical minimum size to ensure that at any time of the year at least some plants have an overlap of emission and reception of fig wasps. Without this temporal overlap, the short-lived pollinator wasps will go locally extinct[413

] When grown outdoors in Britain only one crop is usually obtained, though in exceptionally hot years two crops are sometimes produced. The fruit usually takes about 12 months to mature in Britain, baby fruits no larger than about 15mm long in the autumn usually overwinter to form the following year's crop of fruit. If plants are grown in pots in a conservatory or cold greenhouse, two crops of fruit can be obtained, one in early summer and one in late summer to autumn[260]. Pinch back the new shoots to about six leaves in order to encourage the second crop[260]. Special Features: Attractive foliage, Not North American native, Invasive, Inconspicuous flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 7.2.30 Prunus brigantia

Briançon Apricot

6 tin 9 cyuc 4 kcaak 0 tcan 1 dwat 6 m hkc

hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Prunus brigantia is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in

semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Fruit Oil Seed**Edible Uses:** Oil-Fruit - raw or cooked. A yellow plum about 3cm in diameter with a single large seed[K]. Scarcely edible according to one report[177], but we found it to have a pleasant mealy texture and a sweet flavour[K]. We have found it bearing quite freely, even on young trees no more than 6 years old[K]. An edible oil called 'huile des marmottes' is obtained from the seed[1, 2, 11, 46]. It is used as an olive oil substitute in France[105, 183]. Seed - raw or cooked. Do not eat the seed if it is too bitter - see the notes above on toxicity.

**tcanta Dye Oil**The oil obtained from the seed is also used for lighting[11]. It is aromatic[61]. A green dye can be obtained from the leaves[168]. A dark grey to green dye can be obtained from the fruit[168].

**dwatta** Although no specific mention has been seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238].

**propta Seed** - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Layering in spring.

**nwatta** Thrives in a well-drained moisture-retentive loamy soil, growing well on limestone[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. Three shrubs at Kew in September 1993 were about 1.5 metres tall and still had a few fruits on them, though there was evidence that they had carried a large crop[K]. They fruited well again in 1994[K]. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.31 Prunus dulcis

Almond, Sweet almond

6 tlin 9 cyuc 4 kcak 3 tcan 3 dwat 6 m hku  
htut cyutli tcup hwicli hrasjnutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxre7t hjonli

**drutta** Prunus dulcis is a deciduous Tree growing to 6 m (19ft) by 6 m (19ft). See above for USDA hardness. It is hardy to UK zone 7. It is in flower from March to April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Oil Oil Seed**Edible Uses:** Gum Gum Milk Oil OilSeed - raw, cooked or dried and ground into a powder for use in confections etc[7, 183]. The whole seed can also be roasted, sprouted or used in cakes, confectionery and pastry[183]. The sweet-flavoured forms have a delicious flavour but bitter forms should not be eaten in any quantity - see the notes above on toxicity. The seed is somewhat difficult to digest and so needs to be thoroughly masticated[4]. It can be blended with water to make almond milk[183]. An edible oil is obtained from the seed[183]. It is used mainly as a food flavouring and in cooking[57, 105]. An edible gum is obtained from points of damage on the stems[64].

**tcanta Adhesive Cleanser Cosmetic Dye Gum Gum** Miscellany Oil Oil Soap makingAn oil expressed from the seeds is an excellent lubricant in delicate mechanisms such as watches[4]. It is often used in soaps and cosmetics because it has a softening effect on the skin[4, 7]. A green dye can be obtained from the leaves[168]. A dark grey to green dye

can be obtained from the fruit[168]. A yellow dye is obtained from the roots and leaves[148]. The bruised leaves, when rubbed within any container, will remove strong odours such as garlic or cloves so long as any grease has first been fully cleaned off[4]. A gum from the stems is used as an adhesive[64]. The burnt shell yields a valuable absorbent for coal gas[74]. The burnt pericarp is rich in potassium, it is used in soap making[74]. The seed contains amygdalin, under the influence of water and in the presence of emulsion it can be hydrolyzed to produce benzaldehyde (the almond aroma, formula C6 H5 CHO) and prussic acid (the toxic principle)[74]. **Espalier:** tree or other plants that is trained to grow flat against a support (such as a trellis or wall).

**dwatta** Antiemetic Antitumor Demulcent Emollient Miscellany Nutritive PectoralAs well as being a tasty addition to the diet, almonds are also beneficial to the overall health of the body, being used especially in the treatment of kidney stones, gallstones and constipation[238]. Externally, the oil is applied to dry skins and is also often used as a carrier oil in aromatherapy[238, K]. The seed is demulcent, emollient, laxative, nutritive and pectoral[4, 7, 21]. When used medicinally, the fixed oil from the seed is normally employed[4]. The seed contains 'laetrile', a substance that has also been called vitamin B17[218]. This has been claimed to have a positive effect in the treatment of cancer, but there does not at present seem to be much evidence to support this[K]. The pure substance is almost harmless, but on hydrolysis it yields hydrocyanic acid, a very rapidly acting poison - it should thus be treated with caution[218]. In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being[238]. The leaves are used in the treatment of diabetes[218]. The plant contains the antitumor compound taxifolin[218].

**propta Seed** - requires 2 - 3 months cold stratification and is best sown in a cold frame as soon as it is ripe[200]. Sow stored seed in a cold frame as early in the year as possible[200]. Protect the seed from mice etc. The seed can be rather slow, sometimes taking 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200]. Difficult. Softwood cuttings from strongly growing plants in spring to early summer in a frame[200]. Cuttings of mature wood, late autumn in a frame. Layering in spring.

**nwatta** Global Crop Management: Standard Staple Crop: Protein-oilThrives in a well-drained moisture-retentive loamy soil[11, 200]. Prefers some lime in the soil but is likely to become chlorotic if too much lime is present[1]. Succeeds in sun or partial shade though it fruits better in a sunny position[11, 200]. The almond is often cultivated in the temperate zone for its edible seeds, there are many named varieties[63, 200]. It prefers a Mediterranean climate with a clear distinction between winter and spring, in milder maritime areas it can be induced into flower too early in the season and is then very liable to be damaged by frosts[200]. There is also likely to be a shortage of pollinating insects around when the tree is in flower so hand pollination may improve the crop. Although partially self-fertile, better crops are obtained if at least 2 cultivars are grown[200]. There are two basic forms of almonds, one with bitter seeds and one with 'sweet' seeds. The bitterness is caused by the presence of hydrogen cyanide (see notes above). Although the bitter forms are used in making marzipan and as a food flavouring, the seeds themselves should not be eaten. Even the sweet forms should not be eaten in very large quantities. (Approximately 900 seeds at one time is considered to be a toxic dose for the average adult). Trees are harder than grown on a plum rootstock[11]. Almond seedlings are the preferred rootstock when plants are grown on hot dry soils, peach rootstocks are better for heavier soils[200]. Trees are at least partially self-sterile. Most members of this genus are shallow-rooted and will produce suckers if the roots are damaged[238]. Plants in this genus are notably susceptible to honey fungus[200]. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin

flowers attract bees and hoverflies[24]. Fennel is a poor companion plant in the garden, it inhibits the growth of nearby plants, especially beans, tomatoes and kohlrabi[14, 18]. It is itself inhibited by wormwood and coriander[14, 18].

## 7.2.49 Fagopyrum esculentum

Buckwheat

6 tlin 12 cyuc 4 kcak 4 tcan 3 dwat 1.5 m hku  
htut cyutli hgatkyuctcup hwicli hyshrasjnutnyikfrip hpa7tli frusflatprikliwis hpa7tmwatli hjonli

**drutta** Fagopyrum esculentum is an ANNUAL growing to 1.5 m (5ft) by 0.3 m (1ft in) at a fast rate. It is frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Leaves Seed**Edible Uses:** Rutin-Leaves - raw or cooked like spinach[4]

, 183  
, K  
]. Not that wonderful raw, they improve somewhat with cooking[K]

]. The leaves are rich in rutin[171  
] (see below for more details) and so are a very healthy addition to the diet[K]

].  
Seed - raw or cooked. A nutty flavour, though it has a somewhat gritty texture that is not universally liked[K]

]. It can be cooked like rice[299  
]. The seed can be soaked overnight in warm water then sprouted for a few days and added to salads[183

]. It can also be ground into a powder and used as a cereal[2

, 4  
, 9

], when it can be made into pancakes, noodles, bread etc or be used as a thickening agent in soups etc[46

, 183  
]. It is popular for use in mixtures with wheat, barley or rye flour to improve the taste and nutritional value of bread and other foodstuffs. Up to 30% of buckwheat flour may be mixed in the wheat dough for baking bread[299

]. Due to the absence of gluten, buckwheat is suitable for the diet of people with coeliac disease[299

]. Rich in vitamin B6[160  
]. Excellent beer can be brewed from the grain[244

].  
Fresh leaves and inflorescences are used for the industrial extraction of rutin, which is applied to strengthen the inner lining of blood vessels (however, it is rather the related species Fagopyrum tataricum (L.) Gaertn., which is commonly grown for rutin production). Rutin is also industrially used as a natural pigment, antioxidant, stabilizer, food preserving and absorber of UV light.

**tcanta Dye Green manure Soil reclamation**A very good green manure plant, it can be used to reclaim badly degraded soils and subsoils[1, 18, 20, 201]. A blue dye is obtained from the stems[57, 106]. A brown dye is obtained from the flowers[4]. Livestock forage and feed: Buckwheat has historically been used as feed for cattle, pigs and chickens (Myers and Meinke, 1994). Green manure and cover crop:Buckwheat grows in the shortest time period of all cover crops (Bjorkman and Shail, 2010) flowering within 3 to 6 weeks and completely maturing within 11 to 12 weeks (Bjorkman et al., 2008). Weed suppressor: because buckwheat grows quickly, it is an excellent suppressor of weeds, and it has been used for this purpose in North America for several centuries. Cover crop: Buckwheat can also be grown as a cover crop to prevent erosion, improve soil aggregate stability, scavenge nutrients such as phosphorus and calcium, and mineralize rock phosphate (Clark, 2007; Bjorkman and Shail, 2010). Pollinator and beneficial insect habitat: Buckwheat is an excellent plant for bee pasture and insectary gardens(Mader et al., 2011; Lee-Mader et al., 2014).

About one acre of buckwheat can provide enough forage for a hive of honey bees, producing about 150 pounds of honey in one season (Oplinger et al., 1989; Myers and Meinke, 1994). The flowers also attract beneficial insects such as parasitic wasps, minute pirate bugs, insidious flower bugs, tachinid flies, ladybeetles and hoverflies, which may prey on insect pests of neighboring crops (Clark, 2007; Bjorkman and Shail, 2010). Wildlife habitat:Buckwheat is sometimes an ingredient in birdseed mixes and planted with other crops for wildlife food plots(Oplinger et al., 1989). USDA.gov.

**dwatta** Acid Astringent Eczema Galactogogue VasodilatorBuckwheat is a bitter but pleasant tasting herb that is frequently used medicinally because the leaves are a good source of rutin[238]. Rutin is useful in the treatment of a wide range of circulatory problems, it dilates the blood vessels, reduces capillary permeability and lowers blood pressure[238, 254]. The leaves and shoots of flowering plants are acid, astringent and vasodilator[4, 141, 165]. It is used internally in the treatment of high blood pressure, gout, varicose veins, chilblains, radiation damage etc[4, 141, 165]. It is best used in conjunction with vitamin C since this aids absorption[254]. Often combined with lime flowers (Tilia species), it is a specific treatment for haemorrhage into the retina[254]. The leaves and flowering stems are harvested as the plant begins to flower and are dried for later use[238]. They should be stored in the dark because the active ingredients rapidly degrade in the light[238]. Some caution should be exercised in the use of this herb because it has been known to cause light-sensitive dermatitis[238]. A poultice made from the seeds has been used for restoring the flow of milk in nursing mothers[4]. An infusion of the herb has been used in the treatment of erysipelas (an acute infectious skin disease)[4, 244]. A homeopathic remedy has been made from the leaves[9]. It is used in the treatment of eczema and liver disorders[9].

**propta Seed** - sow from the middle of spring to early summer in situ. The seed usually germinates in 5 days[115]. The earlier sowings are for a seed or leaf crop whilst the later sowings are used mainly for leaf crops or green manure.

**nwatta** Fagopyrum esculentum is a plant of the temperate and subtropical zones, though it can also be grown at higher elevations, generally above 1,500 metres, in the tropics[299

]. It grows best in areas where annual daytime temperatures are within the range 17 - 27°C, but can tolerate 7 - 40°C[418

]. It is very sensitive to frost[299  
]. It prefers a mean annual rainfall in the range 700 - 1,000mm, but tolerates 400 - 1,300mm[418

]. A very easily grown plant, it prefers dry sandy soils but succeeds in most conditions, including poor[57

, 141  
, 171  
]. heavy[18

] or acid soils[141  
] and even sub-soils[160  
]. It prefers a pH in the range 5 - 6.5, tolerating 4.4 - 7.5[418

]. It prefers a cool moist climate, but it also succeeds in dry and arid regions[171

]. Hot drying temperatures and drying weather at blooming time blast the flowers and prevent seed formation[418

]. The plant has a poorly developed root system that makes it rather sensitive to drought[299

]. Fagopyrum esculentum is cultivated in many parts of the world for its edible seed. It is a prolific producer of seeds, and these are often spread by animal activity. It easily escapes from cultivation and can become established as a weed of cultivated and waste ground, though it is easy to control and does not usually become a pest. Buckwheat is a fast-growing plant that can reach its full height within 4 - 6 weeks. Flower formation starts 20 days after emergence, the plant continuing to flower until complete senescence and death of the whole plant. After the onset of flowering, the leaves and stems continue to grow while the fruits develop; hence seed ripening is very uneven, making harvesting difficult. From the middle of the flowering period onwards, when the leaf area has reached its maximum, further growth of the vegetative parts is slow, and producing ripe seed becomes the main focus of the plant. The seed is ready for harvesting 70 - 130

and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - cooked[105, 177] and used as greens[216, 257]. The water in which the leaves is cooked is used in making corn pudding[161, 183]. Seed - used in piñole or ground into a meal and used as a thickener in making bread or mixed with flour in making bread[95, 105, 161, 183].

tcanta None known

dwatta Antispasmodic Epilepsy PoulticeThe plant has been burnt and the smoke inhaled as a treatment for epilepsy[257]. The boiled leaves have been used as a liniment for sore muscles and aches[257]. A poultice of the mashed leaves have been applied to the chest and a decoction of the leaves drunk to treat colds[257].

propta Seed - sow April/May in a cold frame in a compost of peat and sand. Germinates in 1 - 3 weeks at 13°c[134]. Pot up the seedlings when still small into individual pots, grow on in a greenhouse for the first winter and plant out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy. Pot up as soon as they start to root (about 3 weeks) and plant out in their permanent positions late in the following spring[K]. Cuttings of mature wood of the current season's growth, November/December in a frame. Very easy. Pot up in early spring and plant out in their permanent position in early summer[K].

nwatta Requires a light or medium well-drained but not too fertile soil in a sunny position[11, 200]. Tolerates saline and very alkaline soils[200]. Succeeds in a hot dry position. Plants resent root disturbance when they are large[134]. Plants are apt to succumb to winter wet when grown on heavy or rich soils. Shadscale forms hybrids with *Atriplex canescens*, *A. garrettii*, *A. corrugata*, and *A. gardneri* varieties. It is, however, closely allied to *A. parryi* and *A. spinifera*[270]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.47 Rhynchosinapis wrightii

Lundy Cabbage

6 tlin 9 cyuc 4 kcak 0 tcan 0 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Rhynchosinapis wrightii is an evergreen Perennial growing to 1 m (3ft 3in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year; in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[105]. A flavour somewhere between a cabbage and a radish[K]. At its best for harvesting in the winter months, when it makes an acceptable addition to the salad bowl[K]. It is also a reasonable cabbage substitute when cooked[K]. Flowers and young flowering stems - raw or cooked[K]. The flowers make a decorative addition to the salad bowl, whilst the young flowering stems can be used like broccoli. A cabbage-like flavour but with a distinct bitterness[K].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame or outdoor seedbed. The seed usually germinates within a week. Prick out the pot-sown seedlings into individual pots as soon as they are large enough to handle and plant them out in the summer. Those in the outdoor seedbed can be thinned as required (the thinnings can be transplanted or eaten) and be moved to their permanent positions when they are 15 - 25cm tall.

nwatta A very rare plant, it is only found growing wild on Lundy Island in the Bristol channel[17]. It requires a sunny position in a well-drained soil[K]. The plant is fairly hardy and should succeed outdoors in most parts of the country, though

it tends to droop somewhat in very cold weather. It can provide edible leaves all year round, though there are scant pickings as the plant comes into flower and for a month or so afterwards[K]. Plants are generally quite short-lived perennials, though they usually self-sow freely when well-sited[K].

## 7.2.48 Foeniculum vulgare dulce

Sweet Fennel

6 tlin 9 cyuc 4 kcak 4 tcan 3 dwat 1.5 m hkuc

htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Foeniculum vulgare dulce is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Leaves Root Seed StemEdible Uses: Leaves - raw or cooked[52]. A delicious aniseed flavour[183], the young leaves are best since older ones soon become tough. They are often used as a garnish on raw or cooked dishes or added to salads[183]. The leaves are difficult to store dried[200]. Leaf stalks and flower heads - raw or cooked[14, 37, 52, 183]. An aniseed flavour[K]. The aromatic seeds are used as a flavouring in cakes, bread, stuffings etc[2, 4, 5, 21, 27, 183]. The sprouted seeds can be added to salads[183]. An essential oil from the seed is used as a food flavouring in similar ways to the whole seed[1, 46, 183]. Root - cooked[53]. The flavour is somewhat parsnip-like. The leaves or the seeds can be used to make a herb tea[16, 183].

tcanta Dye Essential Repellent StrewingThe seed yields up to 5% of an essential oil[1, 4, 46]. This is used medicinally, as a food flavouring, in toothpastes, soaps, perfumery, air fresheners etc[1, 46, 238]. The flavour of fennel oil depends upon its two main constituents. 'Fenphone' is a bitter tasting element whilst 'anethole' has a sweet anise-like flavour[238]. The proportions of these two ingredients varies according to strain and region. Plants growing in the Mediterranean and southern Europe usually have a sweet oil whilst plants growing in central and northern Europe usually produce a more bitter oil[238]. The quality of the oil also depends upon how well the seed has been dried - the oil from fully ripened and dried seeds being much sweeter and more fragrant[245]. The dried plant is an insect repellent[14, 53], the crushed leaves are effective for keeping dogs free of fleas[201]. The plant was formerly used as a strewing herb[201]. Yellow and brown dyes are obtained from the flowers and leaves combined[168].

dwatta Analgesic Antiinflammatory Antispasmodic Aromatic Carminative Diuretic Emmenagogue Expectorant Galactogogue Hallucinogenic Stimulant Stomachic UrinaryFennel is a commonly used household remedy, being useful in the treatment of a variety of complaints, especially those of the digestive system. The seeds, leaves and roots can be used, but the seeds are most active medicinally and are the part normally used[4]. An essential oil is often extracted from the seed for medicinal use, though it should not be given to pregnant women[4, 238]. The plant is analgesic, anti-inflammatory, antispasmodic, aromatic, carminative, diuretic, emmenagogue, expectorant, galactogogue, hallucinogenic, laxative, stimulant and stomachic[4, 7, 9, 21, 147, 165, 176, 192, 238]. Fennel is often added to purgatives in order to allay their tendency to cause gripe, and also to improve the flavour[4]. An infusion of the root is used to treat urinary disorders[238]. An essential oil obtained from the seed is used in aromatherapy. Its keyword is 'Normalising'[210]. The essential oil is bactericidal, carminative and stimulant[218]. Some caution is advised, see notes above on toxicity[222].

propta Seed - best sown in early spring in situ[1]. Division in March as the new growth appears[16, 200].

nwatta Succeeds in most soils[1] but prefers a sunny dry position[200]. A cultivar of *F. vulgare*, this is not the genuine Florence fennel since it does not have swollen leaf stems[200]. It is used in much the same way as fennel. See *F. vulgare azoricum* for the genuine Florence fennel[K]. The

to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 7.2.32 Castanea pumila ashei

Chinquapin

6 tlin 9 cyuc 4 kcak 2 tcan 1 dwat 5 m hkuc

htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Castanea pumila ashei is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[2, 61, 105]. Sweet with a nice nutty flavour[46, 82, 183], it is very acceptable raw[142, 161, K]. When baked it becomes even sweeter and develops a floury texture, it makes an excellent potato or cereal substitute[K]. The seed is quite small, about half the size of *C. dentata*[183]. Sold in local markets in America[82].

tcanta Tannin WoodThe bark, leaves, wood and seed husks all contain tannin. Wood - hard, strong, light. Used for fence posts etc[46, 61].

dwatta Antiperiodic Astringent TonicThe leaves contain tannin and are antiperiodic, astringent and tonic[46, 61, 213]. An infusion of the leaves has been used as an external wash for the feverish condition common to colds[213, 257].

propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K]. Division of suckers in winter[200]. They can be planted straight out into their permanent positions.

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. Although it is winter-hardy in most areas of Britain, this species only really thrives in areas with hot summers[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Produces suckers, eventually forming a thicket[182]. An excellent soil-enriching understorey in pine forests[200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Fruits are produced within 2 - 3 years from seed[117]. One report dealing with the type species states that it never fruits in Britain[11]. However, a bush at Wisley fruits well in most years[K]. Therefore it is hoped that this sub-species will also fruit in Britain[K]. There are a few plants at Hilliers Arboretum, but we have never seen them produce fertilized fruits[K]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.33 Cephalotaxus sinensis

Chinese Plum Yew

6 tlin 9 cyuc 4 kcak 3 tcan 1 dwat 5 m hkuc

pcimhhim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Cephalotaxus sinensis is an evergreen Shrub growing to 5 m (16ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year; in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit[81]. Fairly large, about 25mm x 17mm[200]. No more details, though it is closely related to *C. harringtonia*, the fruit of which is edible raw if fully ripe[K]. The fruit does not always ripen in Britain, before full ripeness it has a disgusting resinous flavour that coats the mouth and refuses to go away for hours[K]. It is quite likely that the seed of this species is also edible. More research is required[K].

tcanta Hedge Hedge WoodVery tolerant of pruning, this plant makes a very good hedge in shady positions[200]. The wood is used to make furniture, farm implements, crafts, and utensils[266].

dwatta CancerExtracts from the plant have shown anticancer activity[218]. The branches, roots, leaves, and seeds are a source of many alkaloids, which are used to treat leukaemia and lymphosarcoma[266].

propta Seed - best sown as soon as it is ripe in a cold frame[113], it should then germinate in the following spring[K]. A hard seedcoat can delay germination, especially in if the seed is not sown as soon as it is ripe[81, K]. Stored seed should be cold-stratified and sown in a cold frame in the spring[200]. Germination can take 18 months or more. Prick out the seedlings as soon as they are large enough to handle and grow them on for at least their first winter under cover. Plant out in late spring after the last expected frosts. Greenwood cuttings of terminal shoots, August/September in a humid cold frame[1, 200]. Difficult[113].

nwatta Landscape Uses:Specimen, Woodland garden. Prefers a moist well-drained sandy soil but succeeds in most soils though it dislikes dry gravelly or chalky soils[1, 200]. Prefers a position in semi-shade but tolerates full shade[11, 81] and it also succeeds but does not usually thrive in full sun[200]. It grows very well in the mild wet coastal region of W. Scotland where it succeeds even in full sun[200]. Requires a humid sheltered site[200], strongly disliking very exposed positions[1]. Although the dormant plant is cold-hardy, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Closely related to *C. harringtonia*[11, 200]. Plants are dioecious, but female plants sometimes produce fruits and infertile seeds in the absence of any male plants[11]. However, at least one male plant for every five females should be grown if you are growing the plants for fruit and seed. Plants have also been known to change sex[81]. Male cones are produced in the axils of the previous year's leaves, whilst female cones are borne at the base of branchlets[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

## 7.2.34 Phyllostachys sulphurea viridis

Kou-Chiku

6 tlin 9 cyuc 4 kcak 3 tcan 0 dwat 4 m hkuc

hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Phyllostachys sulphurea viridis is an evergreen Bamboo growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly

acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kaakta Edible Parts:** Shoots **StemEdible Uses:** Young shoots - raw or cooked. Virtually free of acidity even when raw[195], they can be thinly sliced and eaten raw in salads but are usually boiled first[183]. The shoots are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

**tcanta Wood**The canes are used in construction. They are said to have excellent technological properties[195].

**dwatta None known**

**propta Seed - surface sow** as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

**nwatta Requires** a rich damp soil in a sheltered position and plenty of moisture in the growing season. Tolerates dry conditions. This is generally a very hardy species, tolerating temperatures down to about -20°C, but persistent cold springs make the plant lazy in sending up new canes. It dislikes prolonged exposure to hard frosts. In warm parts of Britain this plant can reach 6 metres or more in height. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. This is a good companion species to grow in a woodland because the plants are shallow rooted and do not compete with deep rooted trees[195]. A running rootstock, the plant does not produce enough new shoots to be invasive but it still wanders about a bit. New shoots appear in late May. Although classed as a sub-species, this is in fact the true wild form of the species (the cultivated variegated form was the first to be named and is thus treated as the species type!). It does not reach a good size in cooler climes.

## 7.2.35 *Crataegus caesa*

6 tlin 9 cyuc 4 kcaak 2 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli hgattcuphja7n hwicli hrasljutnyikfrjp hpa7tli flatprikliwis hpa7tmwatlii xre7t hjonli

**drutta Crataegus caesa** is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

**kaakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. A good size fruit, about 20mm in diameter, with a sweet taste and a fair fruit to seed ratio, it has a mealy texture, is fairly juicy and makes very pleasant eating[K]. It ripens in mid to late September and can hang on the tree for several weeks[K]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

**tcanta Wood** - heavy, hard, tough, close-grained. Useful for making tool handles, mallets and other small items[82].

**dwatta Cardiotoxic Hypotensive**Although no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

**propta Seed - this is best sown** as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

**nwatta We** have very little information on this species, and do not know how hardy it will be in this country, or even its country of origin. However, a specimen growing in an open position at Kew Botanical Gardens is about 3 metres tall and wide and regularly carries a heavy crop of fruit[K]. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Hybridizes freely with other members of this genus[200]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

## 7.2.36 *Syzygium australe*

**Brush Cherry**

6 tlin 12 cyuc 4 kcaak 3 tcan 0 dwat 3 m hkuc  
hmimhtut cyutli tucp hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatlii xre7t hjonli

**drutta Syzygium australe** is an evergreen Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kaakta Fruit** - raw or made into jellies[46, 397]. Crisp and juicy, it ranges in flavour from delicious to mediocre[440]. The reddish-pink to red, obovoid fruit is about 15 - 25 mm long and 15 mm in diameter, with a large seed[365].

**tcanta Agroforestry Uses:** The plant has a very dense habit of growth and responds well to trimming. It is often grown as a hedge, especially the cultivar 'Brilliant'[K]. The reddish or yellowish wood is light, elastic and seasons well[46]. It is used for making oars, boat building etc, and was traditionally used for making boomerangs and

samic[207]. The root can be dried and ground into a powder and then be mixed with cereal flours or added as a flavouring to soups etc. The roots have been boiled to make a refreshing and nutritious drink[257]. Young seed sprouts - raw[105, 177, 257]. Seed[106, 257]. No more details are given, though it is most likely used as an aromatic flavouring in cooked foods[K].

**tcanta Disinfectant Incense**The pulverized root has been burnt as an incense[257].

**dwatta Antidandruff Disinfectant Ophthalmic Pectoral Poultrice Salve Stomachic Tonic**Fernleaf biscuitroot was widely employed medicinally by many native North American Indian tribes who considered it to be a universal panacea and used it especially in treating chest problems and skin complaints[207, 257]. It is little, if at all, used in modern herbalism, but probably warrants investigation. The whole plant, but especially the root, is disinfectant, pectoral, salve, stomachic and tonic[257]. The dried root was used in the treatment of rheumatism, stomach complaints, coughs, colds, hay fever, bronchitis, influenza, pneumonia and tuberculosis[207, 257]. The root was burnt and the smoke inhaled in the treatment of asthma and other chest complaints[257], it was also used as a herbal steam bath for treating chest complaints[257]. The root was used to make a drink that was taken as a tonic to help people in a weakened condition gain weight[257]. A poultice of the peeled and crushed roots has been applied to open cuts, sores, boils, bruises and rheumatic joints[257]. The root has been soaked in water and then used as an antidandruff wash for the hair[257]. An infusion of the leaves and stems has been used as a tonic[257]. The root oil has been applied as a salve to sores and also used as an eye wash in the treatment of trachoma[257]. Some people may experience a one-time uncomfortable detox rash (please research more on this plant before taking it).

**propta Seed - best sown** as soon as it is ripe in a cold frame. Stored seed can be rather slow to germinate, when sown in the spring it usually takes at least 12 months to germinate. Giving it a period of cold stratification might reduce this time. The seedlings need to be pricked out into individual pots as soon as they are large enough to handle, and should be planted out into their permanent positions in the summer. Fresh seed can be sown immediately in situ. Division may be possible in spring or autumn.

**nwatta We** have almost no information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in much of the country. It can be assumed that plants will require a dry to moist but well-drained soil in a sunny position. This is a taxonomically very difficult genus, many of the species now included in it have at times been included in other genera[60]. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a tap root similar to a carrot going directly down [1-2].

## 7.2.45 *Atriplex canescens*

**Grey Sage Brush, Fourwing saltbush**

6 tlin 9 cyuc 4 kcaak 3 tcan 1 dwat 1.8 m hkuc  
htut cyutli hgatkyuctup hwicli hyishrasljut hpa7tli flatprikliwissliphson hpa7tmwatlii nyanhjen hjonli

**drutta Atriplex canescens** is an evergreen Shrub growing to 1.8 m (6ft) by 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in July, and the seeds ripen in August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed

is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

**kaakta Edible Parts:** Leaves **SeedEdible Uses:** Colouring **DrinkLeaves** - cooked or raw[85, 94]. A very acceptable taste with a salty tang[K]. The leaves can be used at any time of the year though winter harvesting must be light because the plant is not growing much at this time of year[K]. Seed - cooked[46, 61]. Ground into a powder, mixed with cereals and used in making cakes etc or used as a piñole[94, 95, 183]. It is small and very fiddly to utilize[K]. The ground up seed can also be mixed with water and drunk as a refreshing beverage[183]. The burnt green herb yields culinary ashes high in minerals and these are used by the Hopi Indians to enhance the colour of blue corn products[183, 257]. The ashes can be used like baking soda[257].

**tcanta Dye Fire retardant Fodder Hedge Hedge Potash**A good hedge in maritime areas, it responds well to trimming[K]. The leaves and stems were burnt by the Hopi Indians and the alkaline ash used to maintain the blue colour when cooking blue corn[216]. A yellow dye is obtained from the leaves and stems[257]. The leaves can be made into a soapy lather and used as a hair wash[257]. The plant has fire-retardant properties and can be used for barrier plantings to control bush fires[200].

**dwatta Skin Stings**The leaves can be made into a soapy lather and used as a wash on itches and rashes such as chickenpox[257]. A poultice of the crushed leaves can be applied to ant bites to reduce the pain and swelling[257].

**propta Seed - sow April/May** in a cold frame in a compost of peat and sand. Germination usually takes place within 1 - 3 weeks at 13°C[134]. Pot up the seedlings when still small into individual pots, grow on in a greenhouse for the first winter and plant out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, July/August in a very sandy compost in a frame. Very easy. Pot up as soon as they start to root (about 3 weeks) and plant out in their permanent positions late in the following spring[K]. Cuttings of mature wood of the current season's growth, November/December in a frame. Very easy. Pot up in early spring and plant out in their permanent position in early summer[K].

**nwatta Fodder:** **Bank Management:** **Copice Management:** Fodder **Minor Global Crop**Requires a position in full sun in any well-drained but not too fertile soil[11, 134, 200]. Tolerates saline and very alkaline soils[200]. Plants are very tolerant of maritime exposure, though they dislike wet climates[K]. Resents root disturbance when large. Succeeds in a hot dry position. A very ornamental plant[60], though it is liable to succumb to winter wet when grown on heavy or rich soils[11, 200]. This species forms hybrids with *Atriplex confertifolia* and *A. gardneri*[270]. Dioecious. Male and female plants must be grown if seed is required. Occasional monoecious plants are found[274]. Individual plants can change sex. The change is more generally from female to male and is apparently associated with stress such as cold or drought. It would appear that the change confers a survival advantage on the plant[274].

## 7.2.46 *Atriplex confertifolia*

**Shadscale, Shadscale saltbush**

6 tlin 9 cyuc 4 kcaak 0 tcan 1 dwat 1.8 m hkuc  
htut cyutli hgatkyuctup hwicli hyishrasljut hpa7tli flatprikliwissliphson hpa7tmwatlii nyanhjen hjonli

**drutta Atriplex confertifolia** is an evergreen Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral



stems. *B. oleracea palmifolia*. The Jersey kale produces a very tall stem which has been used as a walking stick. *B. oleracea ramosa*. The thousand-headed and perennial kales are very cold hardy. Their flavour is stronger than most of the other cultivated forms and they are mainly used as a winter crop. This form is very close to the wild species and has the most potential for developing perennial cultivars. *B. oleracea subaunda*. The savoy cabbages form large heads like the cultivated cabbages (*B. oleracea capitata*). They have a stronger flavour, crinkly leaves and are generally more cold-hardy so can provide a winter crop in areas with quite severe winters. *B. oleracea sabellica*. The curly kales have attractively curled leaves. These are quite cold-tolerant plants and are mainly used to provide edible leaves in winter and spring. *B. oleracea viridis*. Collards are a cold-hardy non-heading form of cabbage, used mainly to provide green leaves in the spring. The plant is heat tolerant in zones 6 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is flat with shallow roots forming a plate near the soil surface [1-2].

### 7.2.43 Amorphophallus konjac

Devil's Tongue, Devil's Tongue, Snake Plant, Konjac, Konnyaku Potato, Voodoo Lily  
6 tin 11 cyuc 4 ckak 2 tcan 2 dwat 1.3 m hkuc  
pcimhmim cyutli tcup hwicli hrasjltuy hpa7tli frusflatpriklwis hpa7tmwatli hjonli

trutta Amorphophallus konjac is an evergreen Perennial growing to 1.3 m (4ft 3in) by 1.3 m (4ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. The flowers are pollinated by Flies. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in light shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Corm - cooked[ 200 ]. The root must be thoroughly boiled or baked, it is acrid when raw (see notes above on 'Known Hazards' [ K ])[ 200 ]. Very large, it can be up to 30cm in diameter[ 266 ]. In Japan the large brown tubers are peeled, cooked and pounded to extract their starch, which is solidified with dissolved limestone into an edible gel called 'Konnyaku' [ 183 ]. Konnyaku is a type of flour valued for its use in many dietary products[ 266 ]. The flour is valued for its ability to clean the digestive tract without being a laxative[ 183 ]. A nutritional analysis is available[ 218 ]. This root is very high in water and low in calories, so it is being promoted as a diet food in N. America[ 218 ]. Especially just before the foliage declines prior to dormancy, the tubers are a rich source of mannann, a polysaccharide of mannose and glucose[ 472 ]. The mannose is extracted and widely used in foods for diabetics[ 472 ]. Glucomannann, a soluble fibre formed from mannann and glucose, cannot be metabolized by the human body, but is metabolized by intestinal bacteria. Inside the digestive system, glucomannann absorbs up to 200 times its weight in water without any negative action upon the digestive system. It therefore can give a feeling of fullness and be of use to aid in weight loss, it also relieves constipation and irritable bowel syndrome, as well as reducing serum cholesterol levels[ 472 ]. Glucomannann is widely used as an emulsifier and stabilizer in foods and drinks[ 472 ].

tcanta Other uses rating: Low (2/5). Agroforestry Uses: A system of cultivation, known as jinjenjo, is often practised in Japan. In this, the plants are grown in a natural plant community and heavily mulching the plants with grain straw or wild herbs. The plants thus grown are remarkably free from

pests and diseases. The largest tubers are harvested at the end of the year, leaving the rest in the ground to grow on for harvest in later years[ 472 ]. Other Uses The plant has insecticidal properties[ 218 ]. Glucomannann, obtained from the tuber, has a wide range of used in various industries. It has gelling and film-forming properties and is widely used as an emulsifier and stabilizer in foods, drinks, cosmetics and the pharmaceutical industry. It is also used as a non-clay drilling fluid in the diamond and oil industries[ 472 ]. Ground cover.

dwatta The root is oxytocic and sialagogue[ 178 ]. It is used in the treatment of cancer[ 218 ]. Glucomannann, a soluble fibre obtained from the tuber, cannot be metabolized by the human body, but is metabolized by intestinal bacteria. Inside the digestive system, glucomannann absorbs up to 200 times its weight in water without any negative action upon the digestive system. It therefore can give a feeling of fullness and be of use to aid in weight loss, it also relieves constipation and irritable bowel syndrome, as well as reducing serum cholesterol levels[ 472 ]. The flowers are febrifuge[ 218 ].

propta Seed - best sown in a pot in a warm greenhouse as soon as it is ripe and the pot sealed in a plastic bag to retain moisture. It usually germinates in 1 - 8 months at 24c[ 133 ]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least a couple of years. Plant them out in late spring or early summer, after the last expected frosts, and give them some protection such as a cloche until they are growing away strongly. Division of offsets[ 1 ]. These are rarely produced [ 1 ].

nwatta Plants can tolerate a minimum temperature of 15c during the growing season, though the optimum range is 20 - 25c[ 472 ]. The best crops are produced on deep, fertile, alluvial soils that are slightly acid[ 300 ]. Dislikes heavy clay soils[ 300 ]. Plants require some shade, especially when young[ 300 ]. Members of this genus generally require a moist but well-drained, humus-rich, fertile soil and a position in dappled shade[ 472 ]. The plant produces one enormous leaf and one flowering stem annually. When ripe for pollination, the flowers have a foetid smell to attract carrion flies and midges. This smell disappears once the flower has been pollinated[ 245 ]. The tubers are planted 15cm deep[ 1 ]. Like many species in the family Araceae, this plant has the ability to heat the flowering spadix as the pollen becomes ready for fertilization. This heat greatly increases the strength of the aroma released by the plant, thus attracting more pollinating insects. It can also have the effect of making the insects more active, thus increasing the level of fertilization[ 472 ]. The plant is heat tolerant in zones 12 through 10. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is a corm swelling at the stem base [1-2].

### 7.2.44 Lomatium dissectum

Fernleaf Biscuitroot, Carrotleaf biscuitroot  
6 tin 10 cyuc 4 ckak 2 tcan 2 dwat 1.4 m hkuc  
htut cyutli kyucctup hwicli hrasjltuy hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta Lomatium dissectum is a PERENNIAL growing to 1.4 m (4ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Root SeedEdible Uses: Root - cooked[105, 177, 183, 257]. Resinous and bal-

shields[46]. We do not have any more specific information for the wood of this species, but the various species of *Syzygium* tend to have somewhat similar timber. The general description of *syzygium* timber is as follows:- The heartwood is a golden brown, greyish brown or brown, with pink or purplish glints; it is not clearly demarcated from the 1 - 4cm wide band of sapwood. The texture is fine; the grain slightly interlocked, sometimes wavy or irregular; there are resin deposits. The wood is heavy; moderately hard; somewhat durable, being moderately resistant to fungi and termites, but susceptible to dry wood borers. It seasons slowly, with a high risk of checking and distortion; once dry it is moderately stable in service. It works well with ordinary tools, nailing and screwing are good so long as the wood is pre-bored; gluing is correct. The wood is used for musical instruments, tool handles, furniture components, shipbuilding, heavy carpentry, flooring, joinery etc[848].

dwatta None known

propta Seed - best sown when fresh. Either the whole fruit can be sown, or the seed can be separated from the flesh[397]. Germination usually takes 1 - 2 months but, especially if not sown fresh, may be slow and spasmodic[397, 694]. Cuttings of firm, current season's growth[397].

nwatta A tree of warm temperate and subtropical climates, just reaching into tropical areas[397]. It is tolerant of occasional, light frosts[694]. Succeeds in full sun and in partial shade[694]. Prefers rich soils and assured moisture[397]. Succeeds in most soils[694]. Several named forms have been developed for ornamental purposes, including some compact forms that grow no larger than 2 metres[397].

### 7.2.37 Hibiscus sinosyrriacus

Rose Of Sharon  
6 tin 9 cyuc 4 ckak 3 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltuy hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Hibiscus sinosyrriacus* is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil RootEdible Uses: Oil TeaThe following notes are for the closely related *H. syriacus*. They quite probably also apply to this species[K]. Young leaves - raw or cooked[2, 177, 179, 183]. A very mild flavour, though slightly on the tough side, they make an acceptable addition to the salad bowl[K]. A tea is made from the leaves[2, 177, 240] or the flowers[183]. Flowers - raw or cooked[74, 105, 183]. A mild flavour and mucilaginous texture, they are delightful in salads, both for looking at and for eating[K]. Root - it is edible but very fibrous[144]. Mucilaginous, without very much flavour[144].

tcanta *Dye Fibre Hair Hedge Oil*The following notes are for the closely related *H. syriacus*. They quite probably also apply to this similar species[K]. A low quality fibre is obtained from the stems. It is used for making cordage and paper[74]. The seed contains about 25% oil[74]. No further details are given, but it is likely to be edible. A hair shampoo is made from the leaves[74]. A blue dye is obtained from the flowers[168]. This species is planted as a hedge in S. Europe[50].

dwatta Anthelmintic Antiphlogistic Demulcent Diuretic Dysentery Emollient Expectorant Febrifuge Ophthalmic Skin Stomachic StypticThe following notes are for the closely related *H. syriacus*. They quite possibly also apply to this species[K]. Ophthalmic, styptic[147, 178]. The leaves are diuretic, expectorant and stomachic[218, 240]. A decoction of the flowers is diuretic, ophthalmic and stomachic[147, 218]. It is also used in the treatment of itch and other skin diseases[240], dizziness and bloody stools accompanied by much gas[147]. A decoction of the root bark is antiphlogistic, demulcent, emollient, febrifuge, haemostatic and vermifuge[218, 240]. It is used in the treatment of diarrhoea, dysentery, dysmenorrhoea[240] and dermatophytosis[147].

propta Seed - sow early spring in a greenhouse. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first year. Plant them out into their permanent positions in late spring or early summer. Some reports say that the seed can be sown in situ outside and that it gives a good rate of germination[78, 80, 113]. Cuttings of half-ripe wood, July/August in a frame. Good percentage[113]. Cuttings of mature wood, early autumn in a frame. Good percentage[113]. Layering in mid summer to early autumn[1].

nwatta Prefers a well-drained humus rich fertile soil in a sheltered position in full sun[200]. Succeeds in any soil of good or moderate quality[11]. Dislikes shade or badly drained soils[11]. Plants grow best with their roots in cool moist soil and their tops in a hot sunny position. Plants are hardy in most parts of the country, tolerating temperatures down to around -15°C[200]. They are best grown in the milder areas, however, because of their habit of flowering late in the season and thus being subject to frost damage[200]. When planted in colder parts of the country they will need some protection for the first few winters[200]. This species is closely related to *H. syriacus*, differing mainly in the larger leaves and larger epicalyx[200]. Plants rarely require pruning[219], though they respond well to pruning and trimming and this is best carried out in the spring or just after flowering[219]. The flowers are produced on the current season's growth[200]. and they only open in sunny weather[219]. Plants are late coming into leaf, usually around the end of May or early June[182]. There are some named varieties selected for their ornamental value[11].

### 7.2.38 Prinsepia utilis

Cherry prinsepia  
6 tin 9 cyuc 4 ckak 4 tcan 2 dwat 3.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltuy hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Prinsepia utilis* is a deciduous Shrub growing to 3.5 m (11ft) by 3 m (9ft). It is in flower in February, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit Oil OilEdible Uses: Oil OilFruit - raw or cooked[1, 2, 177, 183]. Liked by children[272]. Sloe-like[146]. It has rather an astringent flavour[K]. The fruit is up to 17mm long and contains a single large seed[K]. An edible oil is obtained from the seed[2, 51, 105, 146]. It is used in cooking[183, 272].

tcanta Hedge Hedge Miscellany Oil Oil Paint Soil stabilization WoodThe seed contains 21% of a fatty oil[240]. As well as being edible, it can also be used for lighting[2, 146, 158, 272]. The oilcake is used for washing clothes[272]. A deep purple colour obtained from the fruits is used for painting windows and walls[272]. Plants are grown as a hedge in the Himalayas[1, 272]. Plants have an extensive root system and are used for binding the soil[272]. Wood - very hard, compact, very liable to split[158].

dwatta *Eczema Miscellany Rubefacient Skin*An oil from the seed is rubefacient[240]. It is applied externally as a treatment for rheumatism and muscular pain caused by hard work[240]. The oil is also applied to the forehead and temples in the treatment of coughs and colds[272]. The heated oilcake is applied as a poultice to the abdomen in the treatment of stomachaches[272]. A paste of this seedcake is used as a poultice to treat ringworm or eczema[272]. The fruit is used in Chinese medicine[129]. We have no more details.

propta Seed - best if given 2 months cold stratification[113]. Sow the seed in autumn if possible, otherwise in late winter or early spring in a cold frame in light shade. Germination may be inhibited by light[113]. Prick out the seedlings when they are large enough to handle into individual pots. Grow them on in a greenhouse or cold frame for their first winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame[113].

nwatta Agroforestry Services: Living fence Management Standard Regional Crop Staple Crop: OilSucceeds in any

moderately fertile well-drained soil in full sun or light shade[200]. Requires a light not too fertile soil[11]. Plants are hardy to about -10°c[184]. The plants produce flowers and fruits better when they are growing in full sun[200]. Flowers are produced on the previous seasons wood[200] and can be produced in the autumn as well as the spring. The flowers are produced on the current years wood according to another report[182]. Autumn flowers can produce ripe fruit in the following spring. Unfortunately, the plants only produce fruit in Britain after long hot summers[200].

## 7.2.39 Sasa kurilensis

Chishima Zasa

6 tin 9 cyuc 4 kcaak 3 tcan 1 dwat 2.5 m hkuc

hmim cyutli tcup hwicli hrasjltunyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Sasa kurilensis is an evergreen Bamboo growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Seed Shoots StemEdible Uses: Young shoots - cooked[177]. They are so popular in Japan that a license is required in order to collect them[183]. Seed - used as a cereal[177]. The seed is only produced at intervals of many years.

tcanta Soil stabilization WoodThe plant has rampant roots and this can be utilized in soil stabilization schemes[195]. The canes are used for making particle boards such as hardboard[195]. The fibre dimensions mean that it is more suitable for thick paper and fibreboard than for thin papers[195]. Yields in Japan are around 45 tonnes per hectare though the cost of gathering and bundling the canes makes economic use problematic[195]. The canes are also used as plant supports etc. The plant has rampant roots and used as a tough, vigorous groundcover for difficult sites.

dwatta CancerA potential cure for cancer has been discovered in the leaf[195].

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°c. Stored seed is best sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse until large enough to plant out, which could be a few years. Plants only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Take large divisions, trying to cause as little root disturbance to the main clump as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Divisions of less than 5 - 6 culms rarely succeed[200].

nwatta Prefers a damp humus rich soil in partial shade[200]. A very hardy species, it grows wild further north than any other bamboo, succeeding even in areas with heavy snow[195]. It tolerates temperatures down to about -20°c[200]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. A polymorphic species[200]. There is at least one named form, selected for its ornamental value[200]. The rootstock can be rampant and invasive[200], it is said to hamper the regeneration of forests in its native habitat[195]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern

is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.40 Amaranthus hybridus

Rough Pigweed, Slim amaranth

6 tin 12 cyuc 4 kcaak 1 tcan 1 dwat 2 m hkuc

htut cyutli tcup hwicli hrasjltunyk hpa7tli flatpriklwis hpa7tmwatli fyif hjonli

drutta Amaranthus hybridus is a ANNUAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 6 and is frost tender. It is in flower from July to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves and young seedlings - cooked as a spinach, added to soups etc or eaten raw[46, 61, 62, 159, 183]. The nutritious leaves have a mild flavour[K]. Seed - raw or cooked[22, 46, 61, 85]. Used as a cereal substitute, the seed is usually ground into a flour for use in porridges, bread etc. It is rather small, about 1mm in diameter[266], but is easy to harvest and very nutritious[K]. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K].

tcanta DyeYellow and green dyes can be obtained from the whole plant[168].

dwatta AstringentA tea made from the leaves is astringent[105, 222]. It is used in the treatment of intestinal bleeding, diarrhoea, excessive menstruation etc[222, 257].

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. Cultivated as a food crop in India[46, 105], there are many named forms[183]. This species has the potential, through crossbreeding, of imparting early maturity to the white seeded grain amaranths[183]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 7.2.41 Lycium barbarum

Goji, Box Thorn, Matrimony vine

6 tin 9 cyuc 4 kcaak 3 tcan 3 dwat 2.5 m hkuc

hmimhtut cyutli tcup hwicli hyishrasjltunyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Lycium barbarum is a deciduous Shrub growing to 2.5 m (8ft) by 4 m (13ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit Leaves ShootsEdible Uses: TeaFruit - raw or cooked[2, 105, 146]. The fruit is a berry

about 2cm in diameter[200, 206]. A mild sweet liquorice flavour[206]. Only the fully ripe fruits should be eaten[K]. Young shoots - cooked[2, 46, 85, 105]. Used mainly as a flavouring, they can also be lightly cooked for 3 - 4 minutes and used as a vegetable, the flavour is somewhat cress-like but has also been described as peppermint-like[206]. The leaves will rapidly once they have been harvested[206]. Some caution is advised, see notes at top of the page. The leaves are a tea substitute[183].

tcanta Hedge Hedge Soil stabilizationCan be grown as an informal hedge, succeeding in maritime exposure[59, 200]. Plants have an extensive root system and can be planted to stabilize sandy banks[200, 206].

dwatta Antibacterial Anticholesterolemic Antipyretic Cancer Diuretic Hypoglycaemic Ophthalmic Purgative Skin Tonic VasodilatorA sweet tonic decoction made from the fruits is used to lower blood pressure and blood cholesterol levels[238]. It acts mainly on the liver and kidneys[61, 176, 238]. The fruit is taken internally in the treatment of high blood pressure, diabetes, poor eyesight, vertigo, lumbago, impotence and menopausal complaints[238]. The fruit is harvested when fully ripe and is dried for later use[238]. The root bark is a bitter, cooling, antibacterial herb that controls coughs and lowers fevers, blood pressure and blood cholesterol levels[61, 176, 238]. It is taken internally in the treatment of chronic fevers, internal haemorrhages, nosebleeds, tuberculosis, coughs, asthma etc[238]. It is applied externally to treat genital itching[238]. The bark is harvested in the winter and dried for later use[238]. Diuretic, purgative, [61, 176]. The plant has a long history of medicinal use, both as a general, energy restoring tonic and also to cure a wide range of ailments from skin rashes and eyesight problems to diabetes[206]. A tonic tea is made from the leaves[206]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed - sow early spring in a greenhouse. Germination is usually good and fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Pinch out the shoot tips of the young plants in order to encourage bushy growth[78]. Cuttings of half-ripe wood, 5 - 10cm with a heel if possible, July/August in individual pots in a frame. Good percentage[78]. Cuttings of mature wood of the current season's growth, autumn to late winter in a cold frame. High percentage[78, 200]. Division of suckers in late winter. Very easy, the suckers can be planted out direct into their permanent positions. Layering.

nwatta An easily grown plant, it does not require a rich soil, flowering and fruiting better in a well-drained soil of moderate quality[1, 200]. Succeeds in impoverished soils[200], but more fertile soils are best if the plant is being grown for its edible young shoots[206]. Requires a sunny position[200]. Some plants at Kew are growing well in light shade[K]. Tolerates maritime exposure[11, 49, 200]. Plants are hardy to about -15°c[202]. There are some named varieties, selected for their ornamental value[206]. Plants are very tolerant of pruning and can regrow from old wood[202]. Any trimming is best carried out in the spring[188]. Plants produce suckers freely and can become invasive when in a suitable position. Otherwise they can be difficult to establish[202]. There is much confusion over the naming of this species. Most, if not all, of the plants being grown as L. chinense or L. europaeum are in fact this species[11]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is suckering with new plants from underground runners away from the plant [2-1].

## 7.2.42 Brassica oleracea

Wild Cabbage, Broccoli, Tronchuda cabbage, Brussels sprouts, Kohlrabi, Sprouting broccoli

6 tin 9 cyuc 4 kcaak 3 tcan 2 dwat 1.2 m hkuc

hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Brassica oleracea is a BIENNIAL/PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[5]. Slightly bitter raw, they can be cooked in one or more changes of water[183]. We find that the slight bitterness actually enhances the flavour, and this is one of our favourite cooked leaves. The plant can usually be harvested all year round, though there will be little to pick in very cold winters[K].

tcanta A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anthelmintic Cardiotoxic Diuretic Laxative StomachicThe leaves are cardiotoxic and stomachic[240]. They have been used in the treatment of gout and rheumatism[240]. The leaves can be used as a poultice to cleanse infected wounds - the affected area will still hot[254]. The poultice should not be left on too long or it can cause blisters[254]. The seeds are anthelmintic, diuretic, laxative and stomachic[240].

propta Seed - sow April in situ. Seedlings transplant very well and so, if you sow the seed too thickly, it is a simple matter to move some of the plants to give them more space. Cuttings root very easily at almost any time in the growing season[K]. Use shoots about 8cm long of the current year's growth and place them in individual pots in the cuttings frame[K].

nwatta Management: Standard Minor Global Crop Staple Crop: ProteinAn easily grown plant, it succeeds in full sun in any reasonable soil, though it prefers a well-drained fertile preferably alkaline soil[200]. It does well in heavy clay soils. It is often found wild by the coast and tolerates considerable maritime exposure. The true wild cabbage is a short-lived perennial, though we have seen specimens 5 years old or more[K]. This species has long been cultivated for its edible leaves, stems etc and a wide diversity of forms have been developed, including cabbages, cauliflowers, broccolis and Brussels sprouts[5]. Most of these forms are biennial in cultivation, though there are also some perennial forms. These different forms are detailed below and have each been given their own entry in the database. We have chosen the most up to date classification we can find, as treated in 'World Economic Plants'. B. oleracea algolabra. Chinese kales are fast-growing plants with tender edible leaves. Although perennials[200], they are usually grown as annuals and are eaten as a summer and autumn crop whilst still young. B. oleracea botrytis. Cauliflowers are grown mainly for their edible swollen inflorescence. Different cultivars can be used to provide crops all year round. B. oleracea botrytis aparagoides. A short-lived perennial form of cauliflower producing a small cauliflower head in the spring followed by a number of broccoli-like flowering shoots. B. oleracea capitata. These are the cultivated cabbages, grown for their edible leaves that usually form a compact head. Reasonably winter hardy, different cultivars can be used to provide edible plants all year round. B. oleracea costata. Couve tronchuda is a tall-growing form of cabbage. It is less hardy than most other forms of this genus. B. oleracea gemmifera. Brussels sprouts form large edible axillary buds 5cm or more long. They are mainly used as late autumn to spring crops. B. oleracea gongyolodes. Kohl rabi produces an edible swollen stem 8cm or more in diameter. It is reasonably cold hardy and provides crops from mid summer to the winter. B. oleracea italica. The calabresses and sprouting broccolis, grown mainly for their edible flowering shoots. Calabrese is the less hardy and is used mainly as an autumn and early winter crop. The sprouting broccolis are very winter hardy and are grown outdoors through the winter to provide a spring to early summer crop. B. oleracea medullosa. Marrowstem kales have edible leaves and

drutta *Aquilegia buergeriana* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Edible Uses: Flowers - raw. Rich in nectar; they have a sweet taste[172, 183], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K]. Leaves - cooked[177]. Some caution is advised - see the notes above on toxicity.

tcanta ParasiticideThe seed is used as a parasiticide to rid the hair of lice[172].

dwatta ParasiticideNone known

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.247 *Polygonum multiflorum*

He Shou Wu, Tuber fleecflower

6 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Polygonum multiflorum* is a PERENNIAL CLIMBER growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Root Seed Edible Uses: Leaves - raw or cooked. Seed - raw or cooked. It is rather small and fiddly to utilize[105]. Flowers[179]. No more details are given. Root - cooked[2, 177]. It should be washed several times in order to leech out the bitterness[179]. This process will also remove many of the vitamins and minerals from the roots[K]. A famine food, it is only used when all else fails[105].

tcanta None known

dwatta Antibacterial Anticholesterolemic Antipyretic Antispasmodic Antitumor Astringent Cardiotoxic Demulcent Deobstruent Hypoglycaemic Laxative Sedative Tonic UrinaryHe Shou Wu is considered to be one of the most important of the Chinese herbal tonics and is widely used in that country[218]. It is said to restore vitality and virility[174], working especially on the liver and the reproductive, urinary and circulatory systems[238]. Some care should be exercised, however, since excessive doses can cause skin rash and numbness of the extremities[238]. The roots and stems are antibacterial, anticholesterolemic, antispasmodic, astringent, cardiotoxic, demulcent, depurative, hypoglycaemic, laxative, sedative, tonic[116, 147, 174, 176, 238, 279]. The roots are taken internally in the treatment of menstrual and menopausal complaints, constipation in the elderly, swollen lymph glands and high cholesterol levels[238]. They are very effective in reducing high cholesterol levels in the blood and increase blood sugar levels[254]. Externally, they are used to treat ringworm, bleeding wounds and sores[238]. The roots are harvested in the autumn, preferably from plants 3 - 4 years old, and are dried for later use[238]. The leaves and roots tonify the liver and kidneys, fortify the blood,

strengthen the muscles and prevent premature greying of the hair[218]. The stem is deobstruent and sedative[218]. It is taken internally in the treatment of insomnia and neurasthenia whilst it is applied externally to ringworm[176, 238]. The stems are harvested in late summer or early autumn and are dried for later use[238]. Extracts of the plant have shown antipyretic, antitumour, hypoglycaemic and sedative activity[218].

propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment[1]. This species is hardy to at least -15°C[238]. Plants seem to be immune to the predations of rabbits[233]. There is a suggestion that this plant might be dioecious[178], in which case male and female plants will need to be grown if seed is required.

## 7.2.248 *Adenophora triphylla*

Nan Sha Shen

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Adenophora triphylla* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in September, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Edible Uses: Root - cooked[105, 177]. The root is thick and carrot shaped[275]. Leaves - cooked[105, 177].

tcanta None known

dwatta Antifungal Cardiotoxic ExpectorantThe root is antifungal, carditonic and expectorant[174, 279]. It is used I Korea to treat bronchial catarrh and coughs, especially where there is excess phlegm[279]. The rot has been shown to contain saponins and triterpenes which are responsible for its expectorant action[279].

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Prefers a light rich slightly alkaline soil that is not too dry and a warm sunny position[1, 200]. Prefers a moist peaty soil in sun or partial shade[187]. Plants are hardy to about -20°C[187]. This species is extremely polymorphic, and several varieties and forms have been described in Japan. The many variations in several characters (hairiness, leaf-shape, inflorescence-shape etc.) can be seen in individuals growing intermixed[275]. This species succeeds in a meadow if the grass is not cut until after the plant flowers[200]. Intolerant of root disturbance[1]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K].

## 7.2.249 *Bumelia lycioides*

Shittamwood

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 8 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwishsom hpa7tmwatli xre7t hjonli

## 7.2.100 *Ipomoea pandurata*

Wild Potato Vine, Man of the earth

6 tlin 9 cyuc 3 kcaak 2 tcan 2 dwat 3.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ipomoea pandurata* is a PERENNIAL CLIMBER growing to 3.5 m (11ft 6in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Root Edible Uses: Root - cooked[85]. The young ones are best[62], they become very acrid as they get old[4]. The roots can be up to 75cm long and 12cm in diameter[4, 207] and can weigh 7 kilos[207]. Roots weighing 10 kilos or more are not unknown[274]. They are best if given a long roasting[95]. Roasted roots taste like sweet potato but with some bitterness[207].

tcanta RepellentAn infusion of the plant has been used for soaking sweet potatoes in order to keep away bugs and moles[257].

dwatta Cathartic Diuretic ExpectorantA poultice of the root is applied to aching joints in the treatment of rheumatism[222, 257]. A tea made from the dried root is diuretic, expectorant and laxative[4, 222, 257]. It has been used in the treatment of strangury and calculus diseases, abdominal pains etc[257]. It also slightly influences the lungs, liver and kidneys without excessive diuresis or catharsis[4, 257]. Caution should be employed because the plant can be strongly laxative[21].

propta Pre-soak the seed for 12 hours in warm water, or scarify the seed, and sow in individual pots in a greenhouse in early spring. The seed usually germinates in 1 - 3 weeks at 22°C. Plants are extremely resentful of root disturbance, even when they are quite small, and should be potted up almost as soon as they germinate[219]. Grow them on in the greenhouse for at least their first winter then plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of side shoots in a peaty soil. Layering.

nwatta Requires a rich well-drained loam in a warm sunny position[200]. The hardiest member of the genus, it tolerates frozen soil and should survive winter temperatures down to at least -10°C[260]. A climbing plant, supporting itself by twining around the branches of other plants[219]. A very ornamental plant[1]. This species has become a troublesome weed in many warm countries and is difficult to eradicate because of its deep root[219]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. Growth habit is a single or multiple shooting vine from a crown [1-2]. Herbaceous. The root pattern is a tap root similar to a carrot going directly down [1-2]. The root pattern is tuberous with swollen potato-like roots [1-2].

## 7.2.101 *Rheum nobile*

Sikkim Rhubarb

6 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Rheum nobile* is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Stem Edible Uses: Leaf stem - raw or cooked[51, 105, 183, 272]. Pleasantly acid, this is a commonly used vegetable where it grows wild[2, 183].

tcanta An ornamental plant[1] hardy to about -15°C.

dwatta Antiemetic Astringent Carminative Depurative Diuretic LaxativeThe root is astringent, carminative, depura-

tive, diuretic, purgative and tonic[51, 91, 240]. Small doses act as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232]. The flowering stem is used in Tibetan medicine, it is said to have a sour taste and a heating potency[241]. It is antiemetic, diuretic and laxative[241]. It is used in the treatment of swellings and fullness of the abdomen as well as to rid the body of retained fluids[241].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade. Grows well in heavy clay soils. A very ornamental plant[1], it is hardy to about -15°C[200]. Plants have proved very difficult to grow in cultivation in Britain[187]. Plants in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 7.2.102 *Silybum marianum*

Milk Thistle, Blessed milkthistle

6 tlin 9 cyuc 3 kcaak 2 tcan 5 dwat m hkuc  
htut cyutli kyucutcup hwicli hrasjlutnyik hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta *Silybum marianum* is a BIENNIAL growing to 1.2 m (4ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year; in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Flowers Leaves Oil Oil Root Stee Uses: Coffee Oil OilRoot - raw or cooked[1, 2, 4, 52, 183]. A mild flavour and somewhat mucilaginous texture[K]. When boiled, the roots resemble salsify (*Tragopogon hispanicus*)[1, 4, 115]. Leaves - raw or cooked[1, 4, 5, 52, 89, 115]. The very sharp leaf-spines must be removed first[46, 183], which is quite a fiddly operation[K]. The leaves are quite thick and have a mild flavour when young, at this time they are quite an acceptable ingredient of mixed salads, though they can become bitter in hot dry weather[K]. When cooked they make an acceptable spinach substitute[238]. It is possible to have leaves available all year round on successional sowings[K]. Flower buds - cooked[1, 238]. A globe artichoke substitute[12, 183], they are used before the flowers open. The flavour is mild and acceptable, but the buds are quite small and even more fiddly to use than globe artichokes[K]. Stems - raw or cooked[4, 100]. They are best peeled and can be soaked to reduce the bitterness[5, 183]. Palatable and nutritious[4, 115], they can be used like asparagus or rhubarb[12] or added to salads. They are best used in spring when they are young[105]. A good quality oil is obtained from the seeds[4]. The roasted seed is a coffee substitute[21, 46, 61, 183].

tcanta Green manure Oil OilA good green manure plant, producing a lot of bulk for incorporation into the soil[K].

dwatta Astringent Bitter Cholagogue Diaphoretic Diuretic Emetic Emmenagogue Hepatic Homeopathy Stimulant Stomachic TonicMilk Thistle has a long history of use in the West as a remedy for depression and liver problems[254]. Recent research has confirmed that it has a remarkable ability to protect the liver from damage resulting from alcoholic and other types of poisoning[254]. The whole plant is astringent, bitter, cholagogue, diaphoretic, diuretic, emetic, em-

menagogue, hepatic, stimulant, stomachic and tonic[4, 21, 160, 165, 238]. It is used internally in the treatment of liver and gall bladder diseases, jaundice, cirrhosis, hepatitis and poisoning[238]. The plant is harvested when in flower and dried for later use[238]. Silymarin, an extract from the seed, acts on the membranes of the liver cells preventing the entry of virus toxins and other toxic compounds and thus preventing damage to the cells[244]. It also dramatically improves liver regeneration in hepatitis, cirrhosis, mushroom poisoning and other diseases of the liver[222, 238, 254]. German research suggests that silybin (a flavonoid component of the seed) is clinically useful in the treatment of severe poisoning by Amanita mushrooms[222]. Seed extracts are produced commercially in Europe[222]. Regeneration of the liver is particularly important in the treatment of cancer since this disease is always characterized by a severely compromised and often partially destroyed liver[K]. A homeopathic remedy is obtained from equal parts of the root and the seed with its hulls still attached[4]. It is used in the treatment of liver and abdominal disorders[9]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Silybum marianum Milk Thistle for dyspeptic complaints, liver and gallbladder complaints (see [302] for critics of commission E).

propta Seed - if sown in situ during March or April, the plant will usually flower in the summer and complete its life cycle in one growing season[K]. The seed can also be sown from May to August when the plant will normally wait until the following year to flower and thus behave as a biennial[K]. The best edible roots should be produced from a May/June sowing, whilst sowing the seed in the spring as well as the summer should ensure a supply of edible leaves all year round[K].

nwatta Succeeds in any well-drained fertile garden soil[1, 200]. Prefers a calcareous soil[12] and a sunny position[200]. Hardy to about -15°C[200]. The blessed thistle is a very ornamental plant that was formerly cultivated as a vegetable crop[1, 61, 238]. Young plants are prone to damage from snails and slugs[200]. Plants will often self sow freely[K].

## 7.2.103 Brassica napus arvensis

Coleseed

6 tlin 9 cyuc 3 kcaok 0 tcan 2 dwat 1.2 m hkuc hmimhmtt cyutli tcup hwicli hrasjutnykrip hpa7tli frusflat-prikwisslip hpa7tmwatli fyfxre7t hjonli

drutta Brassica napus arvensis is a ANNUAL/BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil SeedEdible Uses: Condiment OilLeaves - raw or cooked[4, 34, 37]. Added to salads or used as a potherb[183]. Immature flowering stems - cooked in much the same way as broccoli[183]. An edible oil is obtained from the seed, it is used mainly for cooking purposes, but also for salads[4, 13, 34, 46, 183]. Some caution is advised, see the notes above on toxicity. The sprouted seed is often used as the mustard part of mustard and cress. Eaten in salads[4, 34, 37, 183]. The seed is used as a mustard flavouring[183].

tcanta Fodder Green manure OilThe seed contains up to 45% of an edible semi-drying oil, it is used as a luminant, lubricant, in soap making etc[13, 21, 57, 142]. A good green manure, the deep taproot improves drainage and loosens heavy soils[18, 20, 87].

dwatta Diuretic EmollientThe root is emollient and diuretic[240]. The juice of the roots is used in the treatment of chronic coughs and bronchial catarrh[240, 269]. The seed, powdered, with salt is said to be a folk remedy for cancer[269]. Rape oil is used in massage and oil baths, it is believed to strengthen the skin and keep it cool and healthy. With camphor it is applied as a remedy for rheumatism and stiff joints[269].

propta Seed - sow in situ in early spring to mid-August for a green manure crop.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Succeeds in any reasonable soil[52]. Prefers a heavy soil and cool moist conditions[16, 20]. Sunny days and cool nights are favourable for plant growth whilst dry weather at harvest time is essential[269]. Coleseed is reported to tolerate an annual precipitation of 30 to 280cm, an annual average temperature range of 5 to 27°C and a pH in the range of 4.2 to 8.2[269]. Very young plants are susceptible to cold damage, -4°C either killing or injuring seedlings, whereas -2°C has no effect when the plants are more than one month old[269]. Coleseed is the form of this species most often found either escaped or naturalized in Britain. It has a non-tuberous root and has been cultivated as a fodder crop, oil-seed crop and green manure[17]. Coleseed is 70% self-pollinating and 30% cross-pollinated. Even if wind and insects are absent, seed are still produced. Yield increases with honeybees[269]. The growth of this plant is inhibited by field mustard and hedge mustard growing nearby[18, 20]. This species is closely related to B. rapa[200].

## 7.2.104 Quercus phillyreoides

Black ridge oak,

6 tlin 9 cyuc 3 kcaok 2 tcan 2 dwat 9 m hkuc hmimhmtt cyutli tcup hwicli jlutnykrip hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta Quercus phillyreoides is an evergreen Shrub growing to 9 m (29ft 6in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[105]. Up to 2cm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent TanninA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[11]. Young plants tolerate reasonable levels

can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves - cooked as a spinach[257]. Seed - cooked[257]. Used as a flavour[161, 177]. Very small but easy to harvest and very nutritious. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K].

tcanta DyeYellow and green dyes can be obtained from the whole plant[168].

dwatta None known

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta We have very little information on this species and do not know how well it will grow in Britain, though it should succeed as a spring-sown annual. The following notes are based on the general needs of the genus. Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196].

## 7.2.244 Caulophyllum robustum

Papoose Root

6 tlin 9 cyuc 2 kcaok 0 tcan 2 dwat 0.3 m hkuc pcmhmim cyutli tcup hwicli hrasjut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Caulophyllum robustum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in April, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105, 177].

tcanta None known

dwatta Anthelmintic Antispasmodic Birthing aid Diaphoretic Diuretic Emmenagogue Oxytoxic SedativeThis herb is said to have similar medicinal properties to C. thalictroides[254]. These are:- Papoose root is a traditional herb of the North American Indians and was used extensively by them to facilitate child birth[207]. Modern herbalists still consider it to be a woman's herb and it is commonly used to treat various gynaecological conditions[254]. An acrid, bitter, warming herb, it stimulates the uterus, reduces inflammation, expels intestinal worms and has diuretic effects[238]. The root is anthelmintic, antispasmodic, diaphoretic, diuretic, emmenagogue, oxytoxic and sedative[4, 21, 46, 165, 207]. An infusion of the root in warm water is taken for about 2 weeks before the expected birth date in order to ease the birth[207, 213]. This infusion can also be used as an emmenagogue and a uterine stimulant[213]. Papoose root should therefore be used with some caution by women who are in an earlier stage of pregnancy since it can induce a miscarriage or early delivery[222]. The plant is also taken internally in the treatment of pelvic inflammatory disease, rheumatism and gout[238]. It should not be prescribed for people with hypertension and heart diseases[238]. Any use of this plant is best under the supervision of a qualified practitioner[238]. The roots are normally harvested in the autumn, because they are at their richest at this time[213], and are dried for later use. The root is harvested in early spring as new growth is beginning and is used to make a homeopathic remedy[232]. It is used especially in childbirth and in some forms of rheumatism[232].

propta Seed - best sown as soon as it is ripe in a shady part of a cold frame[200]. If stored seed is used, it should be sown as soon as it is received. Germination can be erratic. Prick out the seedlings as soon as they are large enough to handle and grow them on in a shady part of a greenhouse or cold frame for at least their first winter. Plant them out into their permanent positions during autumn or early winter. Division in spring or just after flowering[200]. Plants are slow to increase[187].

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. The following notes are based on the general needs of the genus. Easily grown in a damp light humus-rich woodland soil preferring a position in deep shade[1, 200]. One report says that it is best in a peat garden. The seeds rupture the ovary before they are fully ripe and continue to expand naked, they are bright blue when fully ripe[130].

## 7.2.245 Griselinia littoralis

6 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 6 m hkuc hmimhmtt cyutli tcup hwicli hrasjut hpa7tli flatprikkwis hpa7tmwatli nyanhjen hjonli

drutta Griselinia littoralis is an evergreen Shrub growing to 6 m (19ft) by 5 m (16ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - a bitter flavour[173].

tcanta Hedge Hedge WoodGrows well by the sea, making a good hedge that tolerates maritime exposure[11, 29, 49]. Plants are very amenable to trimming[200], they are best cut in early summer[188] and can be cut right back into old wood if required. A slow-growing plant, but it makes a nice dense hedge[K]. Wood - very durable, firm, dense but slightly brittle. Used for ship building, railway sleepers etc[46, 61, 123].

dwatta None known

propta Seed - best sown as soon as ripe in a greenhouse. It can also be sown in the spring in a cold frame. Prick out the seedlings when they are large enough to handle and grow on for at least their first winter in a greenhouse. Plant out in late spring after the last expected frosts and give some protection for their first winter outdoors. Cuttings of half-ripe wood 7 cm with a heel, July/August in a frame. Keep the foliage moist. Pot up in August and overwinter in a sheltered position, planting out in late spring after the last expected frosts[78]. Cuttings of mature wood, 7 - 10 cm with a heel, October/November in a frame. High percentage[78].

nwatta Prefers a rich light loam in sun or semi-shade[200]. Tolerates chalky soils[11]. Plants are very tolerant of strong maritime winds[182] but they can be damaged by cold dry winds. Tolerating temperatures down to about -10°C, this species is somewhat tender in most parts of Britain[11] though it usually regrows if cut back by frost[200]. The young shoots in spring are often cut back by late frosts[K]. Very tolerant of root disturbance, it transplants well even when quite large though it would then require staking at first when growing in exposed positions[166]. A number of cultivars have been developed for their ornamental value[182, 200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. It self-sows abundantly in the milder areas of Britain if both sexes are grown[11].

## 7.2.246 Aquilegia buergeriana

6 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 0.6 m hkuc hmimhmtt cyutli tcup hwicli hrasjutnyk hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

nwatta Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Succeeds in most sites, including limestone[81]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Resists wind exposure to some degree[200]. Most trees are only hardy to zone 8 (tolerating temperatures down to about -5 to -10°C) but selected clones can succeed in zone 7 with temperatures down to -15°C[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Difficult to establish because it is sensitive to frost until it is 1.5 metres or more tall, young plants should be given a position sheltered from the early morning sun[11]. Established trees can grow quite vigorously making new growth of 60cm per year for a number of years[185]. Plants in general are slow-growing[1888]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

### 7.2.241 Rosa x beanii

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat m hkuc hmimhtut cyutti tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Rosa x beanii is a deciduous Shrub. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked. There is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102].

tcanta None known

dwatta Antiphlogistic Blood tonic CancerAntiphlogistic, blood tonic[178]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to shorten this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months[K]. Stored seed should be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are

large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeeds in most soils[11], preferring a circum-neutral soil and a sunny position[200]. Grows well in heavy clay soils. Dislikes water-logged soils[200]. A rather tender species, it is best grown on a wall in Britain[1, 11]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. A hybrid species, there is enormous confusion over its origins, some botanists believe that it is *R. multiflora* x *R. laevigata* or *R. banksiae*, others believe that it is *R. banksiae* x *R. moschata*[200]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

### 7.2.242 Clinopodium vulgare

Wild Basil

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutti tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Clinopodium vulgare is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies), insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaEdible leaves - used fresh or dried as a flavouring in cooked foods[5, 8, 12, 183] or fresh as a flavouring in salads[177]. A sweet and aromatic herb tea is made from the fresh leaves[183].

tcanta DyeA yellow and a brown dye are obtained from the leaves[46, 61].

dwatta Aromatic Astringent Cardiotonic Carminative Diaphoretic ExpectorantThe plant is aromatic, astringent, cardiotonic, carminative, diaphoretic and expectorant[4, 145]. An infusion of the plant helps to overcome weak digestion[244].

propta Seed - sow spring in a cold frame. Only just cover the seed. Germination usually takes place within 2 weeks at 21°C. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse. Plant them out in the summer if they have made sufficient growth, otherwise plant them out in late spring or early summer of the following year. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Cuttings of soft wood in May or June.

nwatta Succeeds in almost any well-drained soil[1].

### 7.2.243 Amaranthus powellii

Powell's Amaranth

6 tlin 11 cyuc 2 kcaak 1 tcan 0 dwat 1.8 m hkuc htut cyutti tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyif hjonli

drutta Amaranthus powellii is a ANNUAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is frost tender. The species is monoecious (individual flowers are either male or female, but both sexes

of side shade[200]. Tolerates moderate exposure[166], surviving well but being somewhat stunted[200]. Rarely fruits well in Britain[11]. Trees at Kew in the hot summer of 1989 carried large crops of seed[K]. The seed takes 2 years to ripen[200]. A very ornamental plant[1]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

#### 7.2.105 Brassica napus napus

Rape

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutti tcup hwicli hrasjlutnyikfrip hpa7tli frusflat-prikliwssip hpa7tmwatli fyifre7t hjonli

drutta Brassica napus napus is a ANNUAL/BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil OilEdible Uses: Condiment Oil OilLeaves - raw or cooked[4, 34, 37]. Added to salads or used as a potherb[183]. Immature flowering stems - cooked in much the same way as broccoli[183]. An edible oil is obtained from the seed, it is used mainly for cooking purposes, but also for salads[4, 13, 34, 46, 183]. Some caution is advised, see the notes above on toxicity. The sprouted seed is often used as the mustard part of mustard and cress. Eaten in salads[4, 34, 37, 183]. The seed is used as a mustard flavouring[183].

tcanta Oil OilThe seed contains up to 45% of an edible semi-drying oil, it is used as a luminant, lubricant, in soap making etc[13, 21, 57, 142].

dwatta Diuretic EmollientThe root is emollient and diuretic[240]. The juice of the roots is used in the treatment of chronic coughs and bronchial catarrh[240, 269]. The seed, powdered, with salt is said to be a folk remedy for cancer[269]. Rape oil is used in massage and oil baths, it is believed to strengthen the skin and keep it cool and healthy. With camphor it is applied as a remedy for rheumatism and stiff joints[269].

propta Seed - sow spring in situ.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Succeeds in any reasonable soil[52]. Prefers a heavy soil and cool moist conditions[16, 20]. Sunny days and cool nights are favourable for plant growth whilst dry weather at harvest time is essential[269]. Rape is reported to tolerate an annual precipitation of 30 to 280cm, an annual average temperature range of 5 to 27°C and a pH in the range of 4.2 to 8.2[269]. Very young plants are susceptible to cold damage, -4°C either killing or injuring seedlings, whereas -2°C has no affect when the plants are more than one month old[269]. Rape is widely cultivated for its oil-rich seeds, there are many named varieties. The oil is high in erucic acid and glucosinolates, both of which have anti-nutritional properties. Cultivars have been developed that have a low content of these items and are therefore suitable for food. Rape is 70% self-pollinating and 30% cross-pollinated. Even if wind and insects are absent, seed are still produced. Yield increases with honeybees[269]. The growth of this plant is inhibited by field mustard and hedge mustard growing nearby[18, 20]. This species is closely related to *B. rapa*[200].

#### 7.2.106 Kosteletzkya pentacarpos

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc htut cyutti tcup hwicli hrasjlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Kosteletzkya pentacarpos is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and

basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves Oil RootEdible Uses: Egg Oil TeaLeaves - raw or cooked[2, 4, 100]. They are used as a potherb or to thicken soups[62, 183]. The leaves can be eaten raw but are rather fibrous and somewhat hairy, though the taste is pleasant[K]. Flowers - raw. Added to salads[61]. The following uses are recorded for *Althaea officinalis*, they are said to also apply to this species[61]:- Root - raw or cooked[61]. When boiled and then fried with onions it is said to make a palatable dish that is often used in times of shortage[4]. The root is used as a vegetable[62, 141, 183], it is also dried then ground into a powder, made into a paste and roasted to make the sweet 'marshmallow'[4, 5, 7, 17, 61]. The water left over from cooking any part of the plant can be used as an egg-white substitute in making meringues etc[62]. The water from the root is the most effective[183], it is concentrated by boiling until it has a similar consistency to egg white. A tea is made from the flowers[183]. A tea can also be made from the root[183].

tcanta Adhesive Fibre OilA strong fibre is obtained from the stems. It is used for making string, nets etc[74]. The following uses are recorded for *Althaea officinalis*, they are said to also apply to this species[61]:- A glue can be made from the root[74]. An oil from the seed is used in making paints and varnishes[74].

dwatta None known

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Prefers a deep rich moist sandy soil in a warm sunny position[1, 200]. Plants are hardy to at least -15°C[200].

### 7.2.107 Borago officinalis

Borage, Common borage,Cool-tankard, Tailwort
6 tlin 9 cyuc 3 kcaak 3 tcan 3 dwat 0.6 m hkuc hmimhtut cyutti hgatkuyuctcup hwicli hyishrasjlutnyik hpa7tli flatprikliwssip hpa7tmwatli xre7t hjonli

drutta Borago officinalis is a ANNUAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Leaves OilEdible Uses: Colouring Oil TeaLeaves - raw or cooked[2, 5, 7, 14, 115, 183]. They can be used as a pot-herb or be added to salads[4]. They are also added whole as a flavouring to various drinks such as Pimms and wine-based drinks[238]. The leaves are rich in potassium and calcium, they have a salty cucumber flavour[200]. Very hairy, the whole leaves have an unpleasant feeling in the mouth and so they are best chopped up finely and added to other leaves when eaten in a salad[K]. The leaves should always be used fresh, because they lose their flavour and colour if dried[244]. Flowers - raw. They are used as a decorative garnish on salads and summer fruit drinks[2, 5, 7, 14, 183]. The flowers are very nice, both to look at and to taste with a sweet slightly cucumber-like flavour[K]. A refreshing tea is made from the leaves and/or the flowers[21, 183]. The dried stems are used for flavouring beverages[183]. The seed yields 30% oil, 20% of which is gamma-linolenic acid[141]. Total yields are 0.35 - 0.65 tonnes per hectare[141]. Unfortunately, the seed ripens intermittently over a period of time and falls from the plant when it is ripe, this makes harvesting the seeds in quantity very difficult[K]. An edible blue dye can be obtained from the flowers. It is used to colour vinegar[183].

tcanta Dye Oil RepellentThe growing plant is said to repel insects[14]. A blue dye is obtained from the flowers[7].

This turns pink on contact with acids[238].

dwatta Antirheumatic Demulcent Depurative Diaphoretic Diuretic Emollient Expectorant Febrifuge Hypotensive Lenitive Poulitice Sedative Skin Women's complaintsBorage is a fairly common domestic herbal remedy that has been used since ancient times[244]. It has a particularly good reputation for its beneficial affect on the mind, being used to dispel melancholy and induce euphoria[244]. It is a soothing saline, diuretic herb that soothes damaged or irritated tissues[238]. The leaves, and to a lesser extent the flowers, are demulcent, diaphoretic, depurative, mildly diuretic, emollient, expectorant, febrifuge, lenitive and mildly sedative[4, 7, 9, 14, 201, 238]. An infusion is taken internally in the treatment of a range of ailments including fevers, chest problems and kidney problems[4], though it should not be prescribed to people with liver problems. Externally it is used as a poultice for inflammatory swellings[4, 7]. The leaves are harvested in late spring and the summer as the plant comes into flower. They can be used fresh or dried but should not be stored for more than one year because they soon lose their medicinal properties[238]. The seeds are a rich source of gamma-linolenic acid, this oil helps to regulate the hormonal systems and lowers blood pressure[238]. It is used both internally and externally, helping to relieve skin complaints and pre-menstrual tension[238]. Used for the treatment of phlebitis (inflammation of the veins) [301].

propta Seed - sow April/May in situ. The plants quickly develop a stout tap-root and do not transplant successfully[238]. The seed can also be sown in situ in the autumn, this will produce larger plants and earlier flowering[4]. The plant usually self-sows prolifically.

nwatta Landscape Uses:Border, Foundation, Massing. A very easily grown plant, succeeding in ordinary garden soil[1], preferring a dry soil[37] and a sunny position[138]. It grows particularly well in loose, stony soils with some chalk and sand[244]. Plants are tolerant of poor dry soils, though much bigger specimens are produced when the plants are growing in better conditions[238]. Tolerates a pH in the range 4.8 to 8.3. Borage is often grown as a culinary plant in the herb garden[1, 7]. Although an annual, it usually maintains itself by self-sowing, sometimes in quite a prolific manner, as long as the soil is disturbed by hoeing etc[14, 188]. Plants often develop mildew when growing in dry conditions or towards the end of the growing season[238]. Flowers are a deeper blue when grown in poorer soils[138]. The flowers are rich in a sweet nectar and are very attractive to bees[7, 14, 20, 108, 244]. The growing plant is a good companion for strawberries, tomatoes, courgettes and most other plants[14, 201, 238]. It is said to deter Japanese beetle and tomato hornworms[238]. Special Features:Edible, Fragrant foliage, Not North American native, Invasive, Naturalizing, Suitable for dried flowers, Extended bloom season in Zones 9A and above. The plant is heat tolerant in zones 12 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. A self-seeding annual [1-2].

## 7.2.108 Tritelleia ixoides

Pretty Face, Cook's tritelleia, Golden brodiaea  
6 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli kyucup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Tritelleia ixoides is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August, and the seeds ripen in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium

(loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[105, 257]. Small[161]. Rich in starch, they can be used like potatoes.

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame. Alternatively, the seed can be sown in spring in a cold frame. Germination usually takes place within 1 - 3 months at 15°C. Sow the seed thinly so that there is no need to prick them out and grow the seedlings on in the pot for their first year. Give an occasional liquid feed to ensure that they do not become mineral deficient. Seedlings are prone to damping off so be careful not to overwater them and keep them well ventilated. When they become dormant, pot up the small bulbs placing about 3 in each pot. Grow them on in the greenhouse for another year or two until the bulbs are about 20mm in diameter and then plant them out into their permanent positions when they are dormant in the autumn. Division of flowering size bulbs in autumn. Dig up the clumps of bulbs, replanting the larger ones direct into their permanent positions. It is best to pot up the smaller ones and grow them on in a greenhouse for a year before planting them out when they are dormant in early autumn.

nwatta Easily grown in a bulb frame or a warm sunny position outdoors[90]. Requires a rich well-drained sandy loam[1]. Likes plenty of moisture whilst in growth followed by a warm dry period in late summer and autumn[200]. Bulbs can flower in 2 years from seed[K].

## 7.2.109 Cirsium edule

Edible Thistle

6 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfuxre7t hjonli

drutta Cirsium edule is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies), beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Oil Root StemEdible Uses: Oil-Root - cooked[95, 105, 161, 257]. The root is likely to be rich in inulin, a starch that cannot be digested by humans. This starch thus passes straight through the digestive system and, in some people, ferments to produce flatulence[K]. Young stems - peeled and eaten raw[46, 61, 95, 105]. Soft and sweet[161], they are considered to be a luxury food[257]. Young shoots - raw or cooked as greens[257]. Harvested in spring[257].

tcanta OilThe seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K].

dwatta None known  
propta Seed - sow early spring or autumn in situ. Germination usually takes place within 2 - 8 weeks at 20°C.

nwatta An easily grown plant, succeeding in any ordinary garden soil in a sunny position[200]. A monocarpic species, it grows for a number of years without flowering but then dies after flowering[60].

## 7.2.110 Satureja spicigera

Creeping Savory

6 tin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.1 m hkuc  
htut cyutli hgatkyucup hwicli hyshrasjlut hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Satureja spicigera is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy) and medium

to sow the seed in early winter[113]. The germination is variable and can be slow. Prick out the seedlings into individual pots when they are large enough to handle and grow on the plants for at least their first winter in a greenhouse. Plant out into their permanent positions in early summer and consider giving some protection from winter cold for their first year or two outdoors[K]. Cuttings of half-ripe wood from juvenile trees, July in a frame[113]. Layering.

nwatta Landscape Uses:Pest tolerant, Pollard, Specimen, Street tree. Succeeds in an ordinary loamy soil and in dry soils[1, 11]. Requires a sunny position[1]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. A very ornamental tree[1, 11]. Any pruning that needs to be done is best carried out in the spring[238]. This species strongly resents being transplanted[113], it should be planted out into its permanent position as young as possible and given some protection from winter cold for its first few winters outdoors. Dioecious, male and female plants must be grown if seed is required. Special Features:Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 7.2.239 Isatis tinctoria

Woad, Dyer's woad

6 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwisslip hpa7tmwatli xre7t hjonli

drutta Isatis tinctoria is a BIENNIAL/PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - they require long soaking in order to remove a bitterness, and even then they are still bitter[177, 179]. There is no record of the seeds being edible, but they contain 12 - 34% protein and 12 - 38% fat on a zero moisture basis[218].

tcanta Dye PreservativeWoad is historically famous as a dye plant, having been used as a body paint by the ancient Britons prior to the invasion of the Romans[238]. A blue dye is obtained from the leaves by a complex process that involves fermenting the leaves and produces a foul stench[6, 14, 46, 57, 100, 238]. The dye is rarely used nowadays, having been replaced first by the tropical Indigofera tinctoria and more recently by synthetic substitutes[238]. Nevertheless, it is a very good quality dye that still finds some use amongst artists etc who want to work with natural dyes. A very good quality green is obtained by mixing it with Dyer's greenwood (Genista tinctoria)[238]. Woad is also used to improve the colour and quality of indigo, as well as to form a base for black dyes[244]. The leaves are harvested when fully grown and 3 - 4 harvests can be made in total[244]. Recent research in Germany has shown that (the dyestuff in?) this plant is a very good preservative for wood[Radio 4 Farming programme].

dwatta Antibacterial Antiviral Astringent CancerWoad has rather a mixed press for its medicinal virtues. One author says it is so astringent that it is not fit to be used internally - it is only used externally as a plaster applied to the region of the spleen and as an ointment for ulcers, inflammation and to staunch bleeding[4]. However, it is widely used internally in Chinese herbal medicine where high doses are often employed in order to maintain high levels of active ingredients[238]. The leaves are antibacterial, anticancer, antiviral, astringent and febrifuge[148, 176, 218, 238]. It controls a wide range of pathogenic organisms, including viruses[218, 238]. It is used internally in the treatment of a wide range of disorders, including meningitis, encephalitis, mumps, influenza, erysipelas, heat rash etc[238]. The leaves are harvested in the summer and can be used fresh or dried[238]. They are also macerated and the blue pigment extracted. This is also used medicinally, particularly in the treatment of high fevers and convulsions in children, coughing of blood and as a detoxifier in infections such as mumps[238]. The

root is antibacterial and anticancer[176]. It is used in the treatment of fevers, pyogenic inflammation in influenza and meningitis, macula in acute infectious diseases, erysipelas, mumps and epidemic parotitis[176]. Its antibacterial action is effective against *Bacillus subtilis*, haemolytic streptococcus, *C. diphtheriae*, *E. coli*, *Bacillus typhi*, *B. paratyphi*, *Shigella dysenteriae*, *S. flexneri* and *Salmonella enteritidis*[176]. Both the leaves and the roots are used in the treatment of pneumonia[218]. The root and the whole plant have anticancer properties whilst extracts of the plant have shown bactericidal properties[218].

propta Seed - sow spring in situ. Fresh seed can also be sown in situ in late summer; it will take 20 months to flower but will produce more leaves[169].

nwatta An easily grown plant, it prefers a well-drained fertile soil in a sunny position[14], though it succeeds in ordinary garden soil[1]. Prefers neutral to alkaline conditions[238]. Plants deplete the soil of nutrients and cannot be grown successfully on the same site for more than two years[4]. Plants are hardy to about -15°C[200]. Woad is a biennial, or occasionally a short-lived perennial plant. It has a very long history as a dye plant, being used by the ancient Britons to give a blue colouring to the skin. At one time woad was widely cultivated for this blue dye obtained from its leaves but with the advent of chemical dyes it has fallen into virtual disuse[4]. It is currently (1993) being grown commercially on a small scale in Germany as a wood preservative (An item on BBC's Radio 4 Farming Programme). Plants self-sow freely when they are grown in a suitable position[14], though they tend not to thrive if grown in the same position for more than two years[238].

## 7.2.240 Picea smithiana

Morinda Spruce

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 30 m hkuc  
htut cyutli tcup hwicli hyshrasjlutnyik hpa7tli frusflatprikliwis hpa7tmwatli hjonli

drutta Picea smithiana is an evergreen Tree growing to 30 m (98ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers Inner bark Seed Seedpod Uses: Condiment Gum TeaYoung male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw. Too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172].

tcanta Charcoal Gum Resin Roofing WoodThe bark is very water resistant and is used for roofing and making water troughs[146, 158]. Small quantities of resin are obtained from between the bark and the wood[146]. Wood - soft to moderately hard. Used in construction, shingles, crates, household purposes etc[146, 272]. It is also valued for its use in the pulp industry to make paper[171]. An indifferent fuel but it yields a fairly good charcoal[158].

dwatta Vitamin CNone known

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions



hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: RootEdible Uses: The following use is for the closely related *C. tuberosa*, but is also probably appropriate for this species[K]. Tubers - cooked. Rich in starch[105, 177], but with a fairly bland flavour.

tcanta None known

dwatta Aphrodisiac TBAn infusion of the plant is used as an aphrodisiac[207] and as a strengthener for weakened patients with tuberculosis[257].

propta Seed - sow March in a greenhouse. The seed usually germinates in 4 - 5 weeks at 20°C[164]. When they are large enough to handle, prick the seedlings out into individual pots plant them out in late spring or early summer, after the last expected frosts. Division in early spring. Make sure that each portion has at least one growing bud[111, K]. Cuttings during the growing season. Very easy[200].

nwatta Prefers a light well-drained loam with added leaf-mold[42]. Succeeds in an ordinary, reasonably moist soil in a sunny position with some shelter[164]. Plants are hardy to about -10°C if the roots are protected from freezing[187]. It is probably best to dig up the roots in autumn and store them like dahlias in a cool frost free place[200]. When grown in a light well-drained soil and mulched well, the roots usually survive the winter outdoors[1]. This species is closely related to *C. tuberosa*[200]. The flowers are very ephemeral, individual flowers only living for a few hours[266].

### 7.2.236 Vaccinium myrsinites

Florida Evergreen Blueberry, Shiny blueberry

6 tlin 9 cyuc 2 kcak 0 tcan 1 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium myrsinites is an evergreen Shrub growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked in pies etc[46, 61, 105, 177, 183]. The fruit is about 6mm in diameter[200].

tcanta None known

dwatta Analgesic Febrifuge OphthalmicThe leaves are analgesic, febrifuge and ophthalmic[257]. An infusion has been used in the treatment of colds, sun sickness, eye diseases, headaches, high fever and diarrhoea[257].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Plants are not very hardy in many parts of Britain but they grow well south and west of London[11]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent posi-

tions[200]. Plants in this genus are notably resistant to honey fungus[200].

### 7.2.237 Schisandra repanda

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 6 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli nyanhjen hjonli

drutta Schisandra repanda is a deciduous Climber growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: TeaFruit - raw or cooked[105, 183]. Used in preserves or to make a tea[177, 183].

tcanta None known

dwatta None known

propta Seed - best sown in the autumn in a cold frame[200, 238]. Pre-soak stored seed for 12 hours in warm water and sow in a greenhouse in the spring[238]. Germination can be slow and erratic. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first 2 years. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame. Overwinter in the greenhouse and plant out in late spring[11, 78]. Good percentage[78]. Layering of long shoots in the autumn[200].

nwatta Prefers a rich well-drained moisture retentive soil[11, 200]. Prefers a slightly acid soil but tolerates some alkalinity if plenty of organic matter is added to the soil[200]. Requires some protection from the most intense sunlight[200]. Plants are intolerant of drought[K]. This species has not been properly evaluated for hardiness in Britain but it will probably succeed outdoors in most parts of the country[11], especially if given the protection of a woodland or a wall[K]. The young growth in spring can be damaged by late frosts. Dioecious. Male and female plants must be grown if seed is required.

### 7.2.238 Pistacia chinensis

Chinese Pistache, Chinese Pistachio

6 tlin 9 cyuc 2 kcak 0 tcan 1 dwat 9 m hkuc htut cyutli kyucctup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli nyanhjen hjonli

drutta Pistacia chinensis is a deciduous Tree growing to 9 m (29ft 6in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from April to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Young shoots and leaves - cooked. Used as a vegetable[11, 46, 182, 183]. Seed - cooked. It is roasted and then eaten, or is used in confectionery[105, 183].

tcanta Dye Miscellany Rootstock WoodThe plant can be used as a rootstock for the pistachio nut, *P. vera*[200]. A yellow dye can be obtained from the wood[266]. Wood - hard, durable. Used in furniture making and carpentry[51, 266].

dwatta MiscellanyResin from the related *P. lentiscus* is analgesic, antitussive, expectorant and sedative. It would be worthwhile examining this species[218].

propta Pre-soak the seed for 16 hours in alkalinized water[78], or for 3 - 4 days in warm water[1], and sow late winter in a cold frame or greenhouse[78, 113]. Two months cold stratification may speed up germination, so it might be better

(loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentLeaves - raw or cooked[238]. A peppery flavour, they are used mainly as a flavouring for cooked dishes, especially beans, but are also used as a garnish for salads etc[183]. They have a stronger flavour than summer savory (*S. hortensis*)[238]. The leaves can be used fresh or dried[183].

tcanta A good companion plant in the garden, growing especially well with onions and beans[201]. The plant is said to inhibit the germination of certain seeds[18]. Secretions from the seeds can prevent the germination of nearby seeds[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. Dynamic accumulator

dwatta Antirheumatic Antiseptic Aromatic Carminative Digestive Expectorant Stings StomachicThe whole herb, and especially the flowering shoots, is antiseptic, aromatic, carminative, digestive, expectorant and stomachic[4, 7, 14, 21]. Taken internally, it is said to be a sovereign remedy for colic and a cure for flatulence[4], whilst it is also used to treat nausea, diarrhoea, bronchial congestion, sore throat and menstrual disorders[238]. It should not be prescribed for pregnant women[238]. A sprig of the plant, rubbed onto bee or wasp stings, brings instant relief[4]. The plant is harvested in the summer when in flower and can be used fresh or dried[238]. The essential oil forms an ingredient in lotions for the scalp in cases of incipient baldness[7]. An ointment made from the plant is used externally to relieve arthritic joints[7].

propta Seed - surface sow in April in a greenhouse. Do not allow the compost to dry out. Germination can be slow and erratic[1] but usually takes place within a month[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle. It is usually possible to plant out into their permanent positions during the summer, but if the plants have not grown sufficiently, or if you live in an area of cold winters, it might be best to grow them on in a cold frame for their first winter and plant them out in late spring or early summer of the following year[K]. Cuttings of half-ripe wood, 5 - 8cm taken at a node, July/August in a frame. Pot up in autumn and overwinter in a frame, planting out in late spring or early summer of the following year. A high percentage usually succeed[78]. Cuttings of young wood, preferably with a heel, April/May in a frame[1, 37]. Plant out in the summer if the plants grow well, otherwise overwinter them in a cold frame and plant out in late spring or early summer of the following year[K]. Division in early spring as growth commences[78, 200]. This works best if soil has been mounded up into the bottom 20cm of the plant early in the previous summer[78]. Pot up the divisions and grow them on in a cold frame until they are established. Plant them out in the summer.

nwatta An easily grown plant when given suitable conditions, it prefers a well-drained poor stony soil[4, 14, 27, 52] and succeeds in a hot dry sunny position[200]. It prefers an alkaline soil[200], though is not too fussy. It is intolerant of soils that remain damp and dislikes shade[200]. Plants are hardy to at least -10°C[200] when grown in suitable conditions, but are less hardy in rich soils or damp conditions[K]. A good bee plant[200].

### 7.2.111 Mentha cervina

Hart's Pennyroyal

6 tlin 9 cyuc 3 kcak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Mentha cervina is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaThe leaves have a strong spearmint fragrance and can be used to make a herb

tea[183].

tcanta Essential Repellent StrewingAn essential oil is obtained from the whole plant. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244].

dwatta Antiseptic Carminative FebrifugeA tea made from the leaves of most mint species has traditionally been used in the treatment of fevers, headaches, digestive disorders and various minor ailments[222]. The leaves are harvested as the plant comes into flower and can be dried for later use[238]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Mentha species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[1, 16, 200]. Prefers a slightly acid soil[16]. Grows well in heavy clay soils. A sunny position is best for production of essential oils, but it succeeds in partial shade. Most mints have fairly aggressive spreading roots and, unless you have the space to let them roam, they need to be restrained by some means such as planting them in containers that are buried in the soil[K]. Hybridizes freely with other members of this genus. The leaves have a strong peppermint smell. The flowers are very attractive to bees and butterflies[24]. A good companion plant for growing near cabbages and tomatoes, helping to deter insect pests. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.112 Aesculus indica

Indian Horse Chestnut

6 tlin 9 cyuc 3 kcak 0 tcan 1 dwat 30 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Aesculus indica is a deciduous Tree growing to 30 m (98ft) by 12 m (39ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be dried, ground into a powder and used as a grael[2, 63, 145, 146, 158]. The seed is roasted then eaten in Nepal[272]. It is also dried then ground into a flour and used with wheat flour to develop the flavour when making bread[272]. The seed is quite large, about 35mm in diameter[194], and is easily harvested. Unfortunately it also contains toxic saponins and these need to be removed before it can be eaten. The seed is used as an emergency food in times of famine when all else fails[177]. It is dried and ground into a powder, this is then soaked in water for about 12 hours before use in order to remove the bitter saponins and can be used to make a 'halva'[194]. It is estimated that mature trees yield about 60kg of seeds per annum in the wild[194]. See also the notes above on toxicity.

tcanta Soap WoodSaponins in the seed are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body,

clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Wood - soft, close grained. Used for construction, cases, spoons, cups etc[145, 146, 158].

dwatta Acrid Anthelmintic Antirheumatic Astringent Narcotic StomachicThe seed is astringent, acrid and narcotic[272]. An oil from the seed is applied externally in the treatment of skin disease and rheumatism[240, 243, 272]. The juice of the bark is also used to treat rheumatism[272]. A paste made from the oil cake is applied to the forehead to relieve headaches[272]. The seed is given to horses suffering from colic[240, 243]. It is also used as an anthelmintic on horses to rid them of intestinal parasites[272].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Prefers a deep loamy well-drained soil but is not too fussy[1, 11, 200]. Succeeds on chalk[11]. Dislikes dry soils[11]. This species does very well in south-west England, growing best in areas where the minimum temperatures do not fall below about -5°C[200]. Young shoots in the spring can be cut back by late frosts in low-lying districts[11, 126]. Trees cast quite a dense shade[194]. Most members of this genus transplant easily, even when fairly large[11].

## 7.2.113 Crataegus aestivalis

Eastern Mayhaw, May hawthorn, Mayhaw, Apple Hawthorn 6 tlin 11 cyuc 3 kcaok 5 tcan 2 dwat 9 m hkuc hmimhtut cyutli hgtaccuphja7n hwicli hrasjlutnykfrip hpa77ti frusflatprikhwis hpa7tmwatli xre7t hjonli

drutta Crataegus aestivalis is a deciduous Shrub growing to 9 m (29ft) by 8 m (26ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in March, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

ckakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[160]. Juicy and acid with a pleasant flavour[2]. It is up to 2cm in diameter[227]. The fruit is frequently used and much prized in parts of southern N. America where it is often gathered in quantity from the wild. Its acid flavour makes it a favourite for preserves and jellies[82, 183, 227]. The fruit can also be dried for later use. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta Shelterbelt Soil stabilization WoodBecause it tolerates a wide variety of sites, this species can be used to stabilize banks, for shelterbelts, and to give protection from wind and water erosion[277]. Wood - heavy, hard and strong, but not large enough for commercial use[227]. Useful for making tool handles, mallets and other small items[82].

dwatta Cardiotonic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°C and then cold

stratified for another 3 months at 4°C[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta Landscape Uses:Border, Espalier, Pollard, Specimen, Street tree. A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200, 277]. Once established, it succeeds in excessively moist soils and also tolerates drought[200, 277]. It grows well on a chalk soil and also in heavy clay soils[200]. It thrives in acid soils[160]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. It succeeds well in exposed positions and tolerates atmospheric pollution[200, 277]. A very hardy species, tolerating temperatures down to about -30°C[160]. This species is closely related to *C. opaca* and is included in that species by some botanists. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11]. Occasionally cultivated for its fruit in America, there are some named varieties[183]. Special Features:North American native, Attractive flowers or blooms. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a standard with a non-suckering single trunk [1-2].

## 7.2.114 Mentha pulegium

Pennyroyal

6 tlin 9 cyuc 3 kcaok 0 tcan 3 dwat 0.4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnykfrip hpa77ti flatprikhwis hpa7tmwatli xre7t hjonli

drutta Mentha pulegium is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked[2, 9, 27]. Used as a flavouring in salads or cooked foods[183]. A spearmint-like flavour, though rather coarser; it is not used very often in Britain[4]. A herb tea is made from the fresh or dried leaves[183]. For drying, it should be harvested as the plant comes into flower[4].

tcanta Cleanser Essential Pot-pourri Repellent StrewingAn essential oil is obtained from the whole plant, used in soap making[46, 61] and as a cleanser for fabrics[169]. A yield of 14kg of oil per hectare is considered good[4]. The plant has a low spreading habit and can be used as a ground cover, though it is somewhat sparse in the winter and can be invaded by the more aggressive weeds[K]. The growing or dried plant repels fleas, ants, moths, mice

propta Seed - surface sow in spring in a greenhouse and keep moist. Germination should take place within a couple of weeks. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or early autumn[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Container, Erosion control, Seashore, Specimen, Winter interest. Prefers a deep fertile loamy soil that does not dry out in summer[200] but it also succeeds in any ordinary soil that is not too dry[1, 162], in sun or light shade[200]. Plants can be grown as a focal point in lawns, they also succeed in quite coarse grass[233]. The young growth in spring can be damaged by late frosts. This species is closely related to *M. sachariflorus*[233]. The leaves have saw-toothed edges that can cut the unwary gardener, it is best to wear gloves when working with the plant[200]. Plants seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, Not North American native, Suitable for cut flowers, Suitable for dried flowers.

## 7.2.233 Lithocarpus densiflorus

Tanbark Oak

6 tlin 9 cyuc 2 kcaok 0 tcan 1 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa77ti flatprikhwis hpa7tmwatli hjonli

drutta Lithocarpus densiflorus is an evergreen Tree growing to 10 m (32ft) by 10 m (32ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Oil SeedEdible Uses: OilSeed - cooked[94, 95]. The seed was a staple food for several native North American Indian tribes[257]. It contains bitter-tasting tannins and there are various ways of removing them. The fastest is by soaking the ground-up seed in hot water - if the water is changed at least once the tannins should be removed within 12 hours. Traditionally, the seeds were placed in a cloth bag and either buried in swampy ground or suspended in a running stream for a few months. Once the tannins have been removed, the seed is then dried, ground into a powder and can be used as a porridge or can be mixed with cereal flours in baking bread etc[183, 257]. It has a pleasant taste after it has been leached[161]. The seed is up to 25mm long and wide[82, 229]. The seed is valued for its oil[161].

tcanta Dye Fuel Oil Preservative Tannin WoodThe bark is exceedingly rich in tannin, yielding up to 29%[11, 82, 123, 171]. It has been used as a brown dye and also to preserve rope that is being used in water[257, K]. Wood - hard, strong, close grained, brittle. It is not commercially important and is used mainly for fuel[82, 229].

dwatta Astringent Odontalgic SkinThe bark is very astringent. An infusion is used as a wash for face sores[257]. The infusion can also be held in the mouth to tighten loose teeth[257].

propta The seed is best sown as soon as it is ripe in the autumn in a cold frame[200]. It needs to be protected from mice, squirrels and other seed eaters. The seed has a short viability but can be stored for a few months if kept cool and slightly damp - the salad compartment of a fridge is a good storage place. Germination takes place in the winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots. If the plants are 15cm or more tall by the summer they can be planted out into their permanent positions. Give them a good weed-excluding mulch and some protection from the cold for their first couple of years outdoors. If growth is not sufficient then grow them on in the greenhouse for their first winter and plant them out

into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Prefers a deep fertile soil with medium drainage[200]. Perfectly hardy at Kew[11], trees produced seed at Kew in the very hot summer of 1989[K]. A slow-growing tree in the wild, living up to 300 - 350 years old[229]. Plants usually flower in the spring and sometimes again in the autumn[188]. The seeds take two seasons to ripen[229]. Prolific crops are usually produced every other year in the wild[229].

## 7.2.234 Thymus caespitius

Cretan Thyme

6 tlin 9 cyuc 2 kcaok 0 tcan 2 dwat 0.1 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa77ti prikhwis hpa7tmwatli xre7t hjonli

drutta Thymus caespitius is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

ckakta Edible Parts: Edible Uses: CondimentThe plant is sometimes used as a condiment in cooked foods. The fresh leaves have a tangerine-like scent and can be used with or instead of lemon-scented thyme, *Thymus citriodorus*[183, 238]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Prefers a light, well-drained calcareous soil and a sunny position[200]. Plants tolerate occasional walking on and can be grown in cracks in paths, they also succeed on walls[200]. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to at least -15°C[238]. There is at least one named variety, 'Celery' is a low compact grower that forms small mounds of growth. The leaves have a celery-like flavour[183]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 7.2.235 Commelina dianthifolia

Birdbill Dayflower

6 tlin 9 cyuc 2 kcaok 0 tcan 1 dwat 0.1 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlut hpa77ti flatprikhwis hpa7tmwatli xre7t hjonli

drutta Commelina dianthifolia is a PERENNIAL growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is

kcakta Edible Parts: Oil OilEdible Uses: Oil OilAn oil obtained from the seed is used in cooking[2, 11, 109].

tcanta Dye Insecticide Oil OilA non-drying oil is obtained from the seed - used in textile manufacture, soap making and as an illuminant[1, 11, 166, 178]. The oil consists mainly of olein. It is not subject to polymerize or oxidize, nor does it form solids at low temperatures[174]. A grey dye is obtained from the pink or red petals[168]. The seed cake has insecticidal activity[218].

dwatta AnthelminticThe seed oil is used in the treatment of ringworm[218].

propta Seed - can be sown as soon as it is ripe in a greenhouse[113]. Stored seed should be pre-soaked for 24 hours in warm water and the hard covering around the micropyle should be filed down to leave a thin covering[78, 113, 138]. It usually germinates in 1 - 3 months at 23°c[138]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their permanent positions when they are more than 15cm tall and give them some protection from winter cold for their first year or three outdoors[K]. Cuttings of almost ripe wood, 10 - 15cm with a heel, August/September in a shaded frame. High percentage but slow[78]. Cuttings of firm wood, 7 - 10cm with a heel, end of June in a frame[11, 78]. Keep in a cool greenhouse for the first year[11]. Leaf-bud cuttings, July/August in a frame.

nwatta Landscape Uses:Pest tolerant, Standard, Specimen. Prefers a woodland soil but thrives in a warm open well-drained loam if leafmould is added[1, 11, 200]. A calcifuge plant, preferring a pH between 5 and 7[11, 200]. Prefers the partial shade of a light woodland[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°c[200]. It succeeds on a wall at Kew and outdoors in milder areas[11]. Prefers a wet summer and a cool but not very frosty dry winter[200]. Plants are not very self-compatible, self-fertilized flowers produce few seeds and these are of low viability[200]. This species has been cultivated for many centuries in China for the oil in its seed[109, 219]. A very ornamental plant, some named forms have been developed for their ornamental value. This species is closely related to *C. sasanqua*[11]. Special Features:Not North American native, Attractive flowers or blooms.

## 7.2.230 *Polygonatum stananthum*

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.2 m hkuc pcmhmtt cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta *Polygonatum stananthum* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - cooked[105, 177]. They can be used as an asparagus substitute. Root - cooked[105, 177]. Rich in starch.

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in early autumn in a shady part of a cold greenhouse[200]. Sow stored seed as early in the year as possible. Germination can be slow, they may not come true to type[200] and it takes a few years for them to reach a good size. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in March or October. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a fertile humus rich moisture-retentive well-drained soil in cool shade or semi-shade[200]. Plants

are intolerant of heat and drought but they tolerate most other conditions[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. The young shoots of most members of this genus are very attractive to slugs. Hybridizes with other members of this genus[200].

## 7.2.231 *Berberis calliantha*

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.7 m hkuc hmimhtut cyutli kyuctup hwicli hyishrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta *Berberis calliantha* is an evergreen Shrub growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[K]. An acid flavour[K].

tcanta None known

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of *Berberis* species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Roots in 4 - 8 weeks[113]. Pot up in spring[113]. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils and in full sun[11, 200]. Grows well in heavy clay soils. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely and re-sprout well from the base[200].

## 7.2.232 *Miscanthus floridulus*

Pacific Island silvergrass, Giant Eulalia Grass, Giant Chinese Silver Grass

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 2.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Miscanthus floridulus* is a PERENNIAL growing to 2.5 m (8ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FlowersEdible Uses: The unopened flower spikes are edible[105, 177].

tcanta Hedge HedgePlants can be grown as a screen. Although they die down in the winter they quickly attain their full height each season[200].

dwatta None known

etc[18, 20, 148, 169, 201, 238]. Rats and mice intensely dislike the smell of mint. The plant was therefore used in homes as a strewing herb and has also been spread in granaries to keep the rodents off the grain[244]. A strong infusion applied to the face will keep gnats away in the summer[245]. The aromatic leaves are used as an ingredient of pot-pourri[238].

dwatta Antiseptic Antispasmodic Carminative Diaphoretic Eczema Emmenagogue Sedative Stimulant Uterine tonicPennyroyal has been used for centuries in herbal medicine. Its main value is as a digestive tonic where it increases the secretion of digestive juices and relieves flatulence and colic[254]. Pennyroyal also powerfully stimulates the uterine muscles and encourages menstruation, thus it should not be prescribed for pregnant women since it can procure abortions, this is especially the case if the essential oil is used[238, 254]. The herb is antiseptic, antispasmodic, carminative, diaphoretic, emmenagogue, sedative and stimulant[4, 9, 46, 165]. A tea made from the leaves has traditionally been used in the treatment of fevers, headaches, minor respiratory infections, digestive disorders, menstrual complaints and various minor ailments[222, 238, 254]. It is occasionally used as a treatment for intestinal worms[254]. Externally, an infusion is used to treat itchiness and formication, inflamed skin disorders such as eczema and rheumatic conditions such as gout[254]. The leaves are harvested in the summer as the plant comes into flower and are dried for later use[4]. The essential oil in the leaves is antiseptic, though it is toxic in large doses[222].

propta Seed - sow spring in a cold frame. Germination is usually fairly quick. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. *Mentha* species are very prone to hybridisation and so the seed cannot be relied on to breed true. Even without hybridisation, seedlings will not be uniform and so the content of medicinal oils etc will vary. When growing plants with a particular aroma it is best to propagate them by division[K]. Division can be easily carried out at almost any time of the year, though it is probably best done in the spring or autumn to allow the plant to establish more quickly. Virtually any part of the root is capable of growing into a new plant. Larger divisions can be planted out direct into their permanent positions. However, for maximum increase it is possible to divide the roots up into sections no more than 3cm long and pot these up in light shade in a cold frame. They will quickly become established and can be planted out in the summer.

nwatta Succeeds in most soils and situations so long as the soil is not too dry[200]. Plants are very quickly diminished by dry conditions[4]. Prefers a stiff moist soil that is slightly acid[16, 27, 37, 200]. A sunny position is best for production of essential oils, but plants succeed in partial shade. Pennyroyal is often grown in the herb garden and is also cultivated commercially as a medicinal plant[4, 115]. There are two main forms of this species. One has weak prostrate stems and spreads by rooting where the stems touch the ground, it is only 10cm tall[4]. The other is erect, does not spread so freely and grows about 30cm tall, thus making it easier to harvest[4]. There is also at least one named form, called 'Dwarf' it is only a few centimetres tall[183]. The whole plant a strong spearmint smell. The flowers are very attractive to bees and butterflies[24]. A good companion plant for cabbages and tomatoes[20], helping to repel cabbage root fly and other burrowing insects[201]. Members of this genus are rarely if ever troubled by browsing deer[233]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

## 7.2.115 *Lepidium sativum*

Cress, Garden cress pepperweed

6 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Lepidium sativum* is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has

both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil OilEdible Uses: Condiment Oil OilYoung leaves - raw or cooked[2, 5, 27, 34, 52, 183]. A hot cress-like flavour, it makes an excellent addition (in small quantities) to the salad bowl[K]. An analysis is available. Root is used as a condiment[46, 61]. A hot pungent flavour, but the root is rather small and woody[K]. The fresh or dried seedpods can be used as a pungent seasoning[183]. The seed can be sprouted in relatively low light until the shoots are a few centimetres long and then be used in salads[183]. They take about 7 days to be ready and have a pleasantly hot flavour. An edible oil is obtained from the seed[46, 61, 105].

tcanta Oil OilThe seed yields up to 58% of an edible oil that can also be used for lighting[74].

dwatta Antiasthmatic Antiscorbatic Aperient Diuretic Galactagogue Poultice Stimulant Vitamin CThe leaves are antiscorbatic, diuretic and stimulant[46, 240]. The plant is administered in cases of asthma, cough with expectoration and bleeding piles[240]. The root is used in the treatment of secondary syphilis and tenesmus[240]. The seeds are galactagogue. They have been boiled with milk and used to procure an abortion, they have been applied as a poultice to pains and hurts and have also been used as an aperient[240]. Fresh foliage has 37% Ascorbic acid - vitamin C

propta Seed - if you want a succession of young leaves then it is possible to sow the seed in situ every 3 weeks in succession from early spring to early autumn. Germination is very rapid, usually taking place in less than a week. When sowing seed for use in mustard and cress, the seed is soaked for about 12 hours in warm water and then placed in a humid position. Traditionally, it is sown in a tray on a thin layer of soil, or on some moist blotting paper, and the tray is placed in a warm dark place for a few days to encourage rapid and rather etiolated growth. The seedlings can then be placed in a lighter position for a couple more days to turn green before being eaten. The cress seed should be sown about 3 - 4 days before the mustard for them both to be ready at the same time[264].

nwatta An easily grown plant, it succeeds in most soils[52]. For the best results, however, it requires a moist soil and also some shade during the summer to prevent it running straight to seed[27, 37, 52]. Garden cress is often cultivated as a sprouted seed, there are some named varieties[183]. It is the cress of 'mustard and cress'. A very easy and fast crop, it can be ready within 7 days from sowing the seed[27]. It can also be grown outdoors as full grown plants and can provide fresh leaves for the salad bowl all year round from successional sowings. Plants can be overwintered outdoors to provide edible leaves all year round, though they will require some protection if temperatures fall below -5°c[200]. This plant is cultivated in Ethiopia for the edible oil from its seed[183].

## 7.2.116 *Allium geyeri*

Geyer's Onion, Bulbil onion

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Allium geyeri* is a BULB growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[85, 105, 161]. Used mainly as an onion-flavouring in soups etc, though they were also occasionally eaten raw[257]. The bulbs are eaten by the Navajo Indians[183]. The bulbs are up to 25mm long and 20mm in diameter[200, 270]. Leaves - raw or cooked[85, 105, 161]. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a greenhouse. The seed can also be sown as soon as it is ripe in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division of the plants in summer as they die down. The divisions can be planted direct into their permanent positions if required.

nwatta Prefers a sunny position in a light well-drained soil[1]. Plants are not hardy in the colder wetter conditions of N.W. Britain and are probably best grown in a bulb frame in most parts of the country[203]. The sub-species *A. geyeri* tenerum forms bulbils in its flowering head[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.117 Broussonetia kazinoki

Kozo

6 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 4.5 m hkuc htut cyutli kyuctcup hwicli hyishrasljutnyik hpa7tli flatpriklwis hpa7tmwatli dyat hjonli

drutta Broussonetia kazinoki is a deciduous Tree growing to 4.5 m (14ft 9in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in August, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Fruit LeavesEdible Uses: Fruit - raw[105, 177]. A sweet taste[4]. The fruit comprises a ball about 1cm in diameter with small edible fruits protruding - there is not much edible flesh but it has a lovely flavour[K]. Prolonged ingestion of the fruit is said to weaken the bones[179]. Leaves - cooked and used as a vegetable[105, 177, 183]. Flowers[105, 177, 183]. No more details.

tcanta FibreA fibre from the bark is used in making paper, cloth, rope etc[46, 61]. It is inferior to *B. papyrifera*[4].

dwatta TonicThe fruit is used as a tonic to increase vision and sexual potency[218].

propta Seed - no pre-treatment is required. Sown in the autumn or spring in a greenhouse, germination usually takes place within 1 - 3 months at 15°C[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8 - 12cm long with a heel, July/August in a frame. High percentage[11, 78]. Cuttings of mature wood of the current season's growth, November in a frame[200]. Root cuttings in winter[200]. Layering in spring[200].

nwatta Easily cultivated in a warm sunny position in any soil of reasonable quality[1, 11], thriving on poor sandy or gravelly soils[200]. Tolerates atmospheric pollution[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position

sheltered from the early morning sun[K]. Often cultivated in Japan for the fibre in its bark, the tree is coppiced annually for this purpose[4, 58]. Some plants are monoecious whilst others are dioecious. Male and female plants must usually be grown if seed is required[200].

## 7.2.118 Berberis wilsoniae

Wilson barberry

6 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 1 m hkuc hnmimhtut cyutli kyuctcup hwicli hyishrasljutnyikfrip hpa7tli flatpriklwis hpa7tmwatli fyfixre7t hjonli

drutta Berberis wilsoniae is an evergreen Shrub growing to 1 m (3ft 3in) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit raw or cooked. Very acid with a lemon-like flavour, it goes very well in a muesli[K]. Children and some adults like it raw, at least in small quantities, though most adults prefer to cook it and use it in pies, preserves etc[K]. The fruits are about 6mm long[200].

tcanta DyePlants can be grown as a tall ground cover when planted about 60cm apart each way[208]. A yellow dye is obtained from the root. A shrub for thorny barriers to deter unwanted visitors. Berries loved by birds.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Deciduous to semi-evergreen. Prefers a warm moist loamy soil but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[11, 200]. Hybridizes freely with other members of this genus, especially the closely related *B. aggregata*[11, 200]. The true species is seldom seen in cultivation, having been replaced with its hybrid progeny[182]. There are some named forms, selected for their ornamental value[11]. Plants can be pruned back quite severely, they resprout well from the base[200]. This species is notably resistant to honey fungus[200]. Heat Zone 9-4.

## 7.2.119 Salvia columbariae

Chia, Ziegler's sage

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.7 m hkuc htut cyutli hgatkyuctcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Salvia columbariae is an ANNUAL/PERENNIAL growing to 0.7 m (2ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and

dwatta Antiphlogistic Cancer Cholagogue Cytostatic Depurative PurgativeThe plant is antiphlogistic and depurative[147]. The following report is for the related *P. hexandrum*. It quite probably also applies to this species. The whole plant, but especially the root, is cholagogue, cytostatic and purgative. The plant contains podophyllin, which has an antimyotic effect (it interferes with cell division and can thus prevent the growth of cells). It is, therefore, a possible treatment for cancer, and has been used especially in the treatment of ovarian cancer[46, 51, 57, 64, 65, 124, 244]. However, alopecia is said to be a common side-effect of this treatment[244]. This species contains about twice the quantity of active ingredient than *P. peltatum*[211]. The roots contain several important anti-cancer lignans, including podophyllin and berberine[218]. The roots are also antirheumatic[218]. The root is harvested in the autumn and either dried for later use or the resin is extracted[238]. This plant is highly poisonous and should only be used under the supervision of a qualified practitioner[238]. It should not be prescribed for pregnant women[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Sow stored seed in a cold frame in early spring. The seed germinates in 1 - 4 months at 15°C. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least 2 growing seasons. Plant them out into their permanent positions in the winter when the plants are dormant. Division in March/April[111].

nwatta Prefers a moist peaty soil and filtered light or shade[4, 111]. Grows well in a moist open woodland[28, 31] and also succeeds under beech trees in a deep moist leafy soil[130]. Plants are fairly hardy, but the new growth in spring is frost tender[233]. Plants in this genus have excited quite a lot of interest for the compounds found in their roots which have been shown to have anti-cancer activity[124]. There are various research projects under way (as of 1990)[124]. This species is closely related to *P. hexandrum*[200]. he plant takes some years to become established[124] but is very long lived in a suitable habitat[130].

## 7.2.227 Juniperus conferta

Shore Juniper

6 tlin 10 cyuc 2 kcaak 3 tcan 0 dwat 0.2 m hkuc hnmimhtut cyutli hgatkyuctcup hwicli hyishrasljutnyik hpa7tli flatprikrlwissip hpa7tmwatli nyanhjen hjonli

drutta Juniperus conferta is an evergreen Shrub growing to 0.2 m (0ft 8in) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105]. The cones are about 8 - 10mm in diameter[200].

tcanta A good low ground cover[11], though plants take about 2 years to form effective cover[197]. Plants should be spaced about 90cm apart each way[208].

dwatta None known

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored

dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Landscape Uses:Cascades, Container, Erosion control, Ground cover, Massing, Seashore. Succeeds in hot, dry sandy soils and in maritime exposure[11, 166, 200]. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11]. Succeeds in poor soils and tolerates light shade[197]. Plants are not reliably hardy in the coldest areas of the country[208]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Fragrant foliage, Not North American native, There are no flowers or blooms. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is flat with shallow roots spreading near the soil surface [2-1].

## 7.2.228 Castanopsis cuspidata

Japanese Chinquapin

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 25 m hkuc hnmim cyutli tcup hwicli jlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Castanopsis cuspidata is an evergreen Tree growing to 25 m (82ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind, midges. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[2, 46, 63, 105, 177]. The cotyledon of the nut is eaten boiled or roasted[183].

tcanta None known

dwatta None known

propta Seed - requires a period of cold stratification and is best sown as soon as it is ripe in a cold frame[138]. The seed has a short viability and should not be allowed to dry out. It can be stored for a few months if kept cool and moist (putting it in a plastic bag that is placed in the salad compartment of a fridge works well). Stored seed should be soaked in warm water for 24 - 48 hours prior to sowing[138]. Germination usually takes place within 1 - 3 months at 15°C[138]. As soon as they are large enough to handle, prick out the seedlings into individual pots and plant them out in mid summer if possible, otherwise grow them on in a cold frame for their first winter and plant them out in late spring. Give the young plants some protection from cold for their first few winters outdoors.

nwatta Prefers a good deep medium to stiff loam[1]. Requires a sheltered position in semi-shade and a lime-free soil[138]. Although cold hardy in Britain, this species really requires a warm continental climate if it is to prosper and it does not do well in the maritime climate of this country[200]. It succeeds in the London area but does not attain its full size there[11]. It grows well in S.W. England[11]. The catkins have an unpleasant hawthorn-like smell to attract midges for their pollination[245].

## 7.2.229 Camellia oleifera

Tea-Oil Plant, Tea Oil Camellia

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 4 m hkuc hnmimhtut cyutli tcup hwicli hrasljut hpa7tli frusflatprik hpa7tmwatli xre7t hjonli

drutta Camellia oleifera is an evergreen Shrub growing to 4 m (13ft) by 1.5 m (5ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. It is in leaf all year, in flower from October to April, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

## 7.2.223 Petasites palmatus

Sweet Butterbur, Golden Palms Coltsfoot, Sweet Coltsfoot, Butterbur  
6 tlin 10 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc  
pcimhmmihtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Petasites palmatus is a PERENNIAL growing to 0.4 m (1ft 4in) by 1 m (3ft 3in) at a fast rate. It is in flower from February to April, and the seeds ripen in April. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: Flowers StemEdible Uses: SaltY-oung flower stalks, used before the flower buds appear, are boiled until tender and seasoned with salt[172, 177, 183]. Flower buds - cooked[183]. Leafstalks - peeled and eaten raw[105, 177, 183, 257]. The ash of the plant is used as a salt substitute[46, 61, 95, 102, 183]. To prepare the salt, the stems and leaves are rolled up into balls whilst still green, and after being carefully dried they are placed on top of a very small fire on a rock and burned[213].

tcanta None known

dwatta Pectoral Salmatus is a PERENNIAL growing in treating the first stages of grippe and consumption[257]. The dried and grated roots have been applied as a dressing on boils, swellings and running sores[257]. An infusion of the crushed roots has been used as a wash for sore eyes[257]. A syrup for treating coughs and lung complaints has been made from the roots of this species combined with mullein(*Verbascum* sp.) and plum root (*Prunus* sp.)[257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Seashore, Woodland garden. Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Requires a moist shady position[187]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Plants are hardy to about -20°c[187]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Dioecious, male and female plants must be grown if seed is required. Special Features:Attractive foliage, North American native, Invasive, Wetlands plant.

## 7.2.224 Arisarum vulgare

Friar’s Cowl

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Arisarum vulgare is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf from October to July, in flower in May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - cooked. The acrid juice should first be removed by thorough and repeated washing leaving behind a nutritious and innocuous residue[2, 105, 177]. Thorough drying or cooking will also destroy any harmful elements of this root[K]. The root is frequently used as an emergency food in times of scarcity, it

is about the size of a walnut[2]. One report suggests that the leaves might be edible[177]. If they are they must be well cooked first[K].

tcanta A good ground-cover plant for a shady place[1].  
dwatta None known

propta Seed - we have no details for this species but suggest sowing the seed in a shady part of the greenhouse as soon as it is ripe in the spring if this is possible. Sow stored seed in early spring. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least the first winter in a greenhouse and plant out when dormant in the summer once the tuber has reached a reasonable size. Division in spring after the plant dies down[1].

nwatta Prefers a woodland soil or a sandy loam with leafmould[1]. Grows well in shady rather moist places[1]. A Mediterranean plant, it commences growth in the autumn and, since the leaves are not very hardy, the plant is best grown under protection[90]. It should succeed outdoors at least in the milder parts of the country, if grown in a sheltered woodland. The plant is hardy to about -10°c for short periods but should be given a good mulch in the winter[200]. The plant becomes dormant in spring/summer[200].

## 7.2.225 Anthriscus sylvestris

Cow Parsley, Wild chervil

6 tlin 9 cyuc 2 kcaak 1 tcan 1 dwat 1.2 m hkuc  
pcimhmmihtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Anthriscus sylvestris is a BIENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: The leaves are eaten raw, cooked as a potherb or used as a flavouring[5, 12, 53, 183]. They taste somewhat less than wonderful[K]. Root - cooked[183].

tcanta DyeA beautiful green dye is obtained from the leaves and stem but it is not very permanent[115].

dwatta TonicThe root is soaked for several days in rice washings and then cooked with other foods as a tonic for general weakness[218].

propta Seed - sow as soon as ripe (June/July) in situ. The seed can also be sown April/May in situ. It usually germinates in 1 - 3 months at 20°c.

nwatta Succeeds in most soils. Shade tolerant[31]. The root has been recommended for improvement by selection and breeding as an edible crop[183]. This plant looks quite similar to some poisonous species, make sure that you identify it correctly.

## 7.2.226 Podophyllum aurantiocaula

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc  
pcimhmim cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli dyatxre7t hjonli

drutta Podophyllum aurantiocaula is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: We have no reports for this species but the following report is for the closely related *P. hexandrum*. Fruit - raw. It must only be eaten when it is fully ripe[1, 2, 61, 105]. Juicy but insipid[130]. The fruit is about 5cm long[200].

tcanta None known

the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: Condiment DrinkSeed - raw or cooked[92, 94, 95, 257]. Usually ground into a powder and used as piñole or made into dark-coloured cakes and loaves[183], it has a nutty flavour[92]. It can also be mixed with corn meal when making mush or with ground wheat for gruel[183]. Rich in niacin, thiamine, zinc, calcium and manganese[160], it is also a good source of protein and easily digested fats[274]. It has a high food value and is easily digested[92]. The sprouted seeds can be added to salads and sandwiches[160, 183]. A refreshing drink can be made by steeping the seed in cold water[92, 94, 95, 183]. Alternatively, the seed can be roasted and ground into a powder then mixed with water when it soon becomes a copious gelatinous mass[2]. It is very palatable and nutritious[2]. The seed has been used to render water palatable by removing the alkalis[257]. The leaves are occasionally used as a sage-like seasoning[183].

tcanta DisinfectantNone known

dwatta Digestive Disinfectant Febrifuge OphthalmicThe seed is digestive, disinfectant, febrifuge and ophthalmic[94, 257]. An infusion can be used in the treatment of fevers[257]. A poultice of the seed mush can be applied to infections[257]. The seeds have been kept in the mouth, and chewed during long journeys on foot, in order to give strength[257]. The seeds have been used to cleanse the eyes or remove foreign matter from the eyes[257]. No more information is given here, but in other instances the seed has been placed in the eye, it then forms a gelatinous covering to which any foreign matter in the eye adheres. The seed is washed out of the eye by the eyes own tears[K].

propta Seed - sow April in situ. The plant dislikes root disturbance. If seed supplies are limited then it can be sown in a pot in a greenhouse in March/April, potted up into individual pots as soon as the seedlings are large enough to handle then planted out in May. Germination usually takes 10 - 14 days at 20°c.

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants are lodge resistant[160]. This plant was a staple food crop of the Aztecs[142]. It is often cultivated for its edible seeds, which are used to make a refreshing and nourishing drink. A good bee plant[61]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.120 Calycanthus occidentalis

Californian Allspice, Western sweetshrub

6 tlin 9 cyuc 3 kcaak 2 tcan 1 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Calycanthus occidentalis is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe aromatic bark is dried and used as a substitute for cinnamon and all spice[11, 105]. Some caution is advised, see reports above on toxicity[270].

tcanta Basketry DyeA light brown dye is obtained from the flowers[168]. The wood and the bark from fresh shoots has been used in basket making[257].

dwatta Expectoant StomachicThe bark is expectoant[257]. A decoction of the fresh or dried bark has been used in the treatment of sore throats, severe colds and stomach disorders[257].

propta Seed - best sown in a cold frame as soon as it is ripe. If the seed is harvested 'green' (as soon as it has fully

developed but before it has dried on the plant) and sown immediately it can germinate in 3 weeks[113]. Dried seed germinates in 1 - 6 months at 15°c[138]. Stored seed requires between 3 weeks and 3 months cold stratification before sowing in the spring. When large enough to handle, prick out the seedlings into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer of the following year. Cuttings of half-ripe wood, July/August in a frame. They can be difficult[113]. Layering in spring. Sever the new plants in a wet spell of weather about 15 months later and then lift them in the autumn[78]. High percentage[78]. Division of suckers in early spring[11]. Very easy, they can be planted straight out into their permanent positions if required.

nwatta Prefers a light loamy soil that is deep and moist but succeeds in most fertile soils if they are not shallow[11, 182]. Requires a well-drained soil[188]. Prefers a sunny position but it tolerates shade when grown in warm temperate zones[11, 200]. Requires a sheltered position, protected from cold winds[245]. Plants are hardy to about -15°c[184]. The leaves and the flowers are very aromatic according to one report[188], whilst another says that the leaves and wood are pleasantly aromatic, whilst the flowers have no scent[245]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.121 Ribes curvatum

Granite gooseberry

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ribes curvatum is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. A gooseberry with an acid flavour, it is about 7.5mm in diameter[200].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 4 - 5 months cold stratification at between -2 to 0°c and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Plants are quite tolerant of shade though do not fruit so well in such a position[111]. Hardy to about -20°c[200]. A very ornamental plant[1], it is closely related to *R. niveum*[11, 200]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.122 Tilia caroliniana

Carolina Basswood

6 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 20 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Tilia caroliniana is a deciduous Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in July, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and

prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves**Edible Uses:** TeaYoung leaves - raw[K]. A tea is made from the flowers. A very good chocolate substitute is made from a paste of the ground fruits and flowers[2]. Trials on marketing the product failed because the paste decomposes readily[2].

**tcanta Fibre Wood**A fibre is obtained from the tough inner bark It can be made into diverse items such as mats, shoes and coarse cloth[229]. Wood - soft, light, easily worked. Used for interior finishing, woodenware etc[149].

**dwatta Antispasmodic Diaphoretic Sedative**A tea made from the flowers is antispasmodic, diaphoretic and sedative[226].

**propta Seed** - much of the seed produced in Britain is not viable, cut a few seedcases open to see if there is a seed inside[80]. If possible, obtain fresh seed that is ripe but has not as yet developed a hard seed coat and sow it immediately in a cold frame. It may germinate in the following spring though it could take 18 months[80]. Stored seed can be very slow to germinate. It has a hard seed coat, embryo dormancy and a hard coat on the pericarp. All these factors mean that the seed may take up to 8 years to germinate[80]. One way of shortening this time is to stratify the seed for 5 months at high temperatures (10°C at night, up to 30°C by day) and then 5 months cold stratification[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in spring just before the leaves unfurl. Takes 1 - 3 years[78]. Suckers, when formed, can be removed with as much root as possible during the dormant season and replanted immediately[200].

**nwatta** Prefers a good moist loamy alkaline to neutral soil but succeeds on slightly acid soils[11, 200]. Grows poorly on any very dry or very wet soil[200]. Dislikes exposed positions[200]. Succeeds in sun or semi-shade[188]. One report suggests that this tree is probably tender in Britain[11] whilst another says that it succeeds in zone 7, which means that it should be hardy in most of Britain[200]. A fast-growing tree in its native habitats[227], but it prefers a continental climate, growing more slowly and not producing fertile seed in areas with cool summers[200]. Lime trees tend to hybridise freely if other members of the genus are growing nearby[238]. If growing plants from seed it is important to ensure the seed came from a wild source or from an isolated clump of the single species[K]. Grows best in a woodland situation, young plants tolerate a reasonable level of side shade[200]. A good bee plant[149]. Trees are usually attacked by aphids which cover the ground and the leaves with a sticky honeydew[188]. Quite tolerant of root disturbance, semi-mature trees up to 5 metres tall have been transplanted successfully. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.123 *Camelina sativa*

Gold Of Pleasure

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc

hmimhnt cyutli kyucup hwicli hyhisrasjltunyk hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

**drutta** *Camelina sativa* is a ANNUAL growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Oil **OilEdible Uses:** Oil **Oil**An edible oil is obtained from the seed[2, 17, 105, 177, 183].

**tcanta Broom Fibre Oil Oil**An oil from the seed is used as a luminant and as an emollient for softening the skin[100]. A fibre is obtained from the stems[2, 200]. The stems are used for making brooms[2].

**dwatta** None known

**propta** Seed - sow mid spring in situ.

**nwatta** An easily grown plant, succeeding in most soils and preferring a sunny position[K]. It does well on poor land[115]. Plants can self-sow when well-sited[K]. 'Gold of Pleasure' is occasionally cultivated for the oil in its seed[17, 171]. This species is a bad companion plant, depressing the growth of nearby plants[18]. It has become a noxious weed of cultivated fields in some of the areas into which it has been introduced[2].

## 7.2.124 *Pleioblastus hindsii*

Hinds' cane-bamboo

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 3.5 m hkuc

pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

**drutta** *Pleioblastus hindsii* is an evergreen Bamboo growing to 3.5 m (11ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Stem**Edible Uses:** Young shoots - cooked[105, 177]. A good flavour. The stems are about 1cm in diameter[266].

**tcanta Hedge Hedge Musical Plant support**Canes can be used as plant supports[25] and also make good flutes. The plant can be used as a screen or a hedge[25, 195].

**dwatta** None known

**propta** Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°C. Stored seed should be sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse or cold frame until they are large enough to plant out, which could be a number of years. The plants only flower at intervals of several years and so seed is rarely available. Division as the plant comes into growth in spring. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200].

**nwatta** Succeeds in most soils[25] but prefers a good loamy soil in a sheltered position in semi-shade[1]. Requires deep shade[25] and a position sheltered from north and east winds[11]. Dislikes drought[1]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. Closely related to *P. gramineus*[1]. This species is cultivated for its edible shoots in China[195]. The rootstock is running and invasive[25]. New shoots are produced from April[25].

## 7.2.125 *Quercus oblongifolia*

Mexican Blue Oak

6 tlin 9 cyuc 3 kcaak 2 tcan 2 dwat 8 m hkuc

hmimhnt cyutli tcup hwicli jltunyk hpa7tli flatprikkwis hpa7tmwatli hjonli

**drutta** *Quercus oblongifolia* is an evergreen Shrub growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May, and the seeds ripen all year. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It

**drutta** *Boehmeria nivea* is an evergreen Perennial growing to 1.8 m (6ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

**kcakta Edible Parts:** Leaves **RootEdible Uses:** Edible portion: Root, Leaves, Seeds - oil. Root - peeled and boiled. A pleasant, sweet taste[ 179 ]. We can detect very little flavour, but the root has a very strange mucilaginous texture that does not appeal to most people who have tried it[ K ]. Once in the mouth, it takes a lot of chewing before it is ready to be swallowed[ K ]. The leaves are used for making cakes[ 283 ]. This report could refer to the plants use as a poultice[ K ]. They are also used as a dye to make black rice cake.

**tcanta Fibre Fodder Paper**Agroforestry **Uses:** Planted to prevent erosion in gullies[ 331 ]. Other Uses A fibre is obtained from the inner bark of the stem - of excellent quality, it is highly water-resistant and has a greater tensile strength than cotton[ 418 ]. It is used for textiles, linen etc and is said to be moth-proof[ 1, 46, 57, 61, 74, 171 ]. It is best harvested as the female flowers open[ 169 ]. The outer bark is removed and then the fibrous inner bark is taken off and boiled before being woven into thread[ 178 ]. The fibres are the longest known in the plant realm.[ 61, 171 ] The tensile strength is 7 times that of silk and 8 times that of cotton, this is improved on wetting the fibre[ 61 ]. The fibre is also used for making paper[ 189 ]. The leaves are removed from the stems, the stems are steamed and the fibres stripped off. The fibres are cooked for 2 hours with lye, fresh material might require longer cooking, and they are then beaten in a Hollander beater[ 189 ] before being made into paper.

**dwatta** Antiphlogistic Astringent Demulcent Diuretic Febrifuge Haemostatic Poulitce Resolvent Vulnerary Women's complaintsAntiphlogistic, demulcent, diuretic, febrifuge, haemostatic and vulnerary. Used to prevent miscarriages and promote the drainage of pus[ 147, 178 ]. The leaves are astringent and resolvent[ 218, 240 ]. They are used in the treatment of fluxes and wounds[ 218 ]. The root contains the flavonoid rutin[ 283 ]. It is antiabortifacient, antibacterial, cooling, demulcent, diuretic, resolvent and uterosedative[ 218, 283 ]. It is used in the treatment of threatened abortions, colic of pregnancy, haemorrhoids, leucorrhoea, impetigo etc[ 283 ]. The fresh root is pounded into a mush and used as a poultice[ 283 ].

**propta** Seed - sow in pots and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and plant them out when at least 20cm tall. Division. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best planted in a nursery until they are growing away well. Layering. Basal cuttings. Harvest new shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade until they are rooting well.

**nwatta** Fodder: Bank Industrial Crop: Fiber Management: Fodder Management: Hay Minor Global Crop Staple Crop: ProteinA plant of the sub-tropics to the tropics, also succeeding in warm temperate areas. The plant can be grown between latitudes 6 - 45°N and 9 - 38°S. It is adapted to a relative air humidity about 80%. Both excessive rainfall and drought affects the quality of the fibre. Relatively flat areas, not subject to flooding as well as gentle sloping lands, not subject to erosion are suitable for ramie production. It is found at elevations up to 1,300 metres. It grows best in areas where annual daytime temperatures are within the range 17 - 27°C, but can tolerate 10 - 34°C[ 418 ]. It prefers a mean annual rainfall in the range 1,500 - 2,500mm, but tolerates 1,000 - 4,000mm[ 418 ]. Requires a rich warm sandy soil that is very well drained[ 1, 57, 123, 200 ]. Succeeds in a wide range of soils so long as they are fertile[ 418 ]. Intolerant of wet soils[ 200 ]. This is a very greedy plant that can soon impoverish a soil, it requires a lot of feeding if it is to perform well[ 123 ]. All plant remains, after the fibre has been removed, should be returned to the soil[ 123 ]. Prefers a pH in the range 5.4 - 6.5, tolerating 4.8 - 7.5[ 418 ]. *Boehmeria nivea* is an extremely variable species

that is widespread over large areas of subtropical and tropical Asia. Its complex species includes several infraspecific taxa, four varieties of which are found in China[ 266 ]. The sub-species *B. Nivea tenacissima*. (Gaud.)Miquel., which produces the fibre 'Rhea' is a native of Malaysia and is not hardy in Britain[ 200 ]. Yields are from 375 to 900 kilos of fibre (per acre?)[ 123 ]. Two to four harvests per year are possible depending upon the climate, it is harvested as the stems turn brown[ 123 ]. Yields of green plants may in temperate regions vary between 15 - 20 tonnes/ha and in tropical areas 8 - 10 tonnes/ha. Yields of about 1400 kg fibre/ha have been reported[ 418 ]. There are an increase in yields in the 2nd and 3rd year[ 418 ]. Stems can be harvested 2 - 3 times per year in temperate areas, 4 - 5 times in subtropical areas and in the tropics up to 6 crops can be produced annually[ 418 ]. The crop is normally replanted after 7 - 10 years, but may persist for 20 years[ 418 ]. The plant tends to take up whatever minerals are present in the soil. This could cause problems for example high uptake of molybdenum can lead to conditioned copper deficiency[ 289 ]. Found In: Africa, Asia, Australia, Bangladesh, Brazil, China\*, East Africa, Fiji, Haiti, Hawaii, India, Indochina, Indonesia, Japan, Laos, Malaysia, Mozambique, Norfolk Island, Pacific, Philippines, Rwanda, SE Asia, South America, Taiwan, USA, Vietnam.

## 7.2.222 *Mahonia gracilipes*

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc

pcimhmim cyutli tcup hwicli hyhisrasjltunyk hpa7tli flat-prikkwis hpa7tmwatli xre7t hjonli

**drutta** *Mahonia gracilipes* is an evergreen Shrub growing to 1.5 m (5ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. We have no specific information on the fruit of this species, but all members of the genus have more or less edible fruit.

**tcanta** None known

**dwatta** Antibacterial Antitumor Bitter DysenteryBerberine, universally present in rhizomes of *Mahonia* species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

**propta** Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

**nwatta** An easily grown shrub, it thrives in any good garden soil[11] including heavy clays. Prefers a semi-shaded woodland position in a damp, slightly acid to neutral humus-rich soil[200]. Plants can tolerate temperatures down to about -10°C[200]. Plants are very tolerant of pruning and can be cut right back into old wood if they have outgrown their welcome[182]. Plants produce suckers and form gradually spreading clumps[200]. Hybridizes freely with other members of this genus.



Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200]. The fruit is produced on long sprigs and is therefore easier to harvest[119]. It is being used in modern breeding programmes for blackcurrants[119].

### 7.2.218 Erysimum hieraciifolium

European wallflower,

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hyhisrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Erysimum hieraciifolium is a BIENNIAL/PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Tender young shoots and leaves - cooked as a vegetable[272].

tcanta None known

dwatta None known

propta Seed - sow spring or late summer in situ. Germination should take place within 3 weeks.

nwatta Prefers a position in full sun in a circumneutral soil[200]. Succeeds in ordinary garden soils, tolerating poor and dry soils[200]. Plants are short-lived perennials and are often biennial[200]. A good nectar source for butterflies[200].

### 7.2.219 Yucca harrimaniae

Spanish Bayonet, New Mexico Spanish bayonet

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.4 m hkuc hmimhtut cyutli hgatkuyuctup hwicli hyhisrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Yucca harrimaniae is an evergreen Shrub growing to 0.4 m (1ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: Flowers Fruit StemEdible Uses: Fruit - the immature fruit is cooked. A bitter taste, but most of the bitterness is in the skin[85]. Flowers - raw or cooked[85]. They are delicious raw, and can also be dried, crushed and used as a flavouring[164]. Flowering stem - peeled, cooked and used like asparagus[164]. The whitish inner portion is eaten[85].

tcanta Broom Fibre SoapA fibre obtained from the leaves is used for making ropes, baskets and mats[82, 85, 169]. The leaves themselves can be used as paint brushes[92], brooms or woven to make mats etc[85]. The roots are rich in saponins and can be used as a soap substitute[85].

dwatta None known

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°C. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots

in a greenhouse until established[78]. Division of suckers in late spring[111]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Thrives in any soil but prefers a sandy loam and full exposure to the south[11]. Requires a sunny position[11]. Plants are hardier when grown on poor sandy soils[200]. Established plants are very drought resistant, this species is also tolerant of cool damp weather[11]. Hardy to at least -30°C[164]. Closely allied to *Y. glauca*[1]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in later years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]

### 7.2.220 Anagallis arvensis

Scarlet Pimpernel

6 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 0.1 m hkuc

htut cyutli kyuctup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Anagallis arvensis is an ANNUAL growing to 0.1 m (0ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 105, 115]. Used in salads[4] and as a spinach[2]. The tender shoots are cooked as a vegetable[272]. It is best not to eat these leaves[55, 238], see the notes above on toxicity.

tcanta SoapThe squeezed plant is used in Nepal for washing and bathing[272]. Anagallis arvensis is insecticidal or at least is repellent to some insects. Dynamic accumulator.

dwatta Antidepressant Antipruritic Antitussive Antiviral Cholagogue Diaphoretic Diuretic Epilepsy Expectorant Homeopathy Nervine Purgative Stimulant VulneraryThe scarlet pimpernel was at one time highly regarded as a medicinal herb, especially in the treatment of epilepsy and mental problems[254], but there is little evidence to support its efficacy and it is no longer recommended for internal use because it contains toxic saponins and cytotoxic cucurbitacins[238, 254]. The whole herb is antitussive, cholagogue, diaphoretic, diuretic, expectorant, nervine, purgative, stimulant and vulnerary[4, 7, 9, 21, 46]. It can be taken internally or applied externally as a poultice[7]. An infusion is used in the treatment of dropsy, skin infections and disorders of the liver and gall bladder[9, 272]. The plant is best harvested in June and can be dried for later use[4]. Use with caution[21], large doses can cause polyuria and tremor[7]. A homeopathic remedy is made from the plant[9]. It is used internally to treat itchy skins and externally to remove warts[9].

propta Seed - sow spring in situ.

nwatta Prefers a sunny position and a good soil[1]. Succeeds in dry or sandy soils[238]. The flowers open at about 8 am and close at 3pm each day, though they close earlier if it rains. The flowers are also said to foretell wet weather if they close early[207].

### 7.2.221 Boehmeria indica

Ramie, Chinese Grass, Chinese Silk Plant

6 tlin 9 cyuc 2 kcaak 5 tcan 2 dwat 1.8 m hkuc hmimhtut cyutli kyuctup hwicli hras hpa7tli frusflatprikliwis hpa7tmwatli hjonli

prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[161, 181]. A staple food for some native North American Indian tribes[257]. Very sweet[177, 200], it is up to 2cm long and 8mm wide[82, 200]. The seed can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. If any seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - very heavy, hard, strong, brittle[82]. It is sometimes used as a fuel[82].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

### 7.2.126 Torreya californica

California Nutmeg

6 tlin 9 cyuc 3 kcaak 0 tcan 1 dwat 15 m hkuc

pchimimhtut cyutli tcup hwicli hrasjltunyk hpa7tli frusflatprikliwsslip hpa7tmwatli nyanhjen hjonli

drutta Torreya californica is an evergreen Tree growing to 15 m (49ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[183]. The seeds are roasted and eaten[257]. They are rich in oil[105, 161]. The ovoid seed is up to 2cm long[K]. An edible oil is obtained from the seed[177, 183].

tcanta Basketry Oil WoodThe roots have been used as splints in basketry[257]. Wood - straight-grained, strong, light, soft, easily worked. Of no commercial value[229], though it is occasionally used for fence posts[82, 229].

dwatta Analgesic Diaphoretic Effrigitic Stomachic TBThe nuts have been chewed as a treatment for indigestion[257]. A decoction of the nuts has been used in the treatment of tuberculosis[257]. The crushed seeds have been rubbed on the temples in the treatment of headaches[257]. They have also been rubbed on the body to cause sweating in the treatment of chills and fevers[257].

propta Seed - best sown as soon as it is ripe in a cold frame. Some of the seed should germinate in the following spring though much of it might take another 12 months. Stored seed requires a period of cold stratification and can take 18 months or more to germinate. Prick out the seedlings into individual pots as soon as growth is observed and grow them on in light shade in the greenhouse for at least the next couple of winters, making sure to pot them on into larger pots as and when required. Plant them out into their permanent positions in early summer when the plants are at least 20cm tall. Cuttings of half-ripe shoots in late summer[1]. Cuttings do not grow well[11]. Layering.

nwatta Succeeds in ordinary garden soil, tolerating some lime[1]. Undemanding as to the soil pH[200]. Dislikes wind exposure[200]. Requires a sheltered position and either high humidity or a moist riverside soil[200]. Tolerates woodland shade very well[200]. One report says that trees are only hardy in the milder parts of Britain[1], whilst another says that trees are hardy in Britain at least as far north as Edinburgh[200]. This species is the only member of the genus that is fully adapted to cool maritime sites. It can actually grow faster in such a position than it does in the wild[200]. Trees in general grow better in the wetter western part of Britain[81]. Usually slow growing, though trees occasionally increase by 60cm in a year[185]. The bruised leaves release a powerful resinous smell[245]. The fruits are also aromatic[245]. The seed takes two summers to mature[229]. Trees often crop well at Kew, but there were no seeds formed in 1994[K]. A tree in fairly deep shade at Kew was carrying a good crop of seeds in the summer of 1996[K]. Plants are usually dioecious, but isolated female plants have been known to bear fruit in the absence of a pollinating male[11]. Plants are sometimes monoecious with dioecious branches. Male and female plants must usually be grown if seed is required.

### 7.2.127 Vitis cinerea

Spanish Grape

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc

hmimhtut cyutli kyuctup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis cinerea is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit Leaves SapEdible Uses: Fruit - raw or dried for winter use[161, 177]. A rich pleasant flavour[2, 183]. The fruit is rather small, but it is borne in very large clusters[2]. It has a slightly bitter flavour, but is pleasant when fully ripe[200]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked.

tcanta DyeUsed as a rootstock[183]. A yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a

frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This species is used in breeding programmes for improved grape cultivars[183]. It produces very large clusters of remarkably small fruits[2]. Plants in this genus are notably susceptible to honey fungus[200].

### 7.2.128 Asparagus cochinchinensis

Chinese Asparagus

6 tlin 9 cyuc 3 kcaak 0 tcan 3 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Asparagus cochinchinensis is a PERENNIAL growing to 1.5 m (5ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June, and the seeds ripen in September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Fruit RootEdible Uses: Tubers - cooked[1, 61, 177]. The tubers are up to 5cm long and 2m wide[266]. They are washed to remove the bitterness, the fibrous core is removed and the root is then boiled[46, 179]. It tastes like asparagus[22]. Another report says that the tubers are eaten after preserving in sugar[183]. The fruit is said to be edible[183]. The fruit is about 6 - 8mm in diameter[200]. Another report says that the berries are harmful if eaten[238].

tcanta InsecticideKills the larvae of flies and mosquitoes[176]. No more details.

dwatta Antibacterial Antiinflammatory Antipyretic Antiseptic Antitussive Cancer Diuretic Expectorant Infertility Nervine Sialogogue Stomachic TonicThis species has been used in traditional Chinese medicine for over 2,000 years[238]. The roots contain asparagine, mucilage, starch and sugars[283]. The dried root is antibacterial, anti-inflammatory, antipyretic, antiseptic, antitussive, diuretic, expectorant, nervine, sialogogue, stomachic, nervous stimulant and tonic[176, 178, 218, 238, 279]. It is taken internally in the treatment of fevers, debility, sore throats, coughs etc[238]. It is often decocted with other herbs and used in the treatment of a wide range of ailments including diabetes mellitus[218]. It is commonly used in restorative recipes together with *Rehmannia glutinosa* and *Codonopsis javanica*[283]. Prolonged usage is recommended for the treatment of impotence[218]. The root is harvested when the plant is dormant and is dried for later use[238]. The plant has a folk history for the treatment of cancer, modern research has detected antitumour activity and it is now being studied for the treatment of lung cancer[218].

propta Seed - pre-soak for 12 hours in warm water and then sow in spring or as soon as the seed is ripe in early autumn in a greenhouse. It usually germinates in 3 - 6 weeks at 25°c[134]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a sunny position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Division in early spring as the plant comes into growth.

nwatta Easily grown in any good garden soil[200]. Prefers a rich light well-drained sandy loam in a sunny posi-

tion[238]. Plants are almost hardy in Britain according to one report[1], whilst others say that the plants tolerate temperatures down to between -10 and -15°c[200, 238]. Dioecious. Male and female plants must be grown if seed is required.

### 7.2.129 Actinidia callosa

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 9 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Actinidia callosa is a deciduous Climber growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees, insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[272]. A very delicate flavour[2, 51, 105, 146, 177]. An acid flavour[183]. The fruit can be dried[183]. The fruits are grayish-green when fully ripe and 18 - 50mm long[266]. They contain a number of small seeds, but these are easily eaten with the fruit[K].

tcanta WoodThe wood is porous[146].

dwatta None known

propta Seed - sow spring in a greenhouse[133]. It is probably best if the seed is given 3 months stratification[113], either sow it in a cold frame as soon as it is ripe in November or as soon as it is received. Fresh seed germinates in 2 - 3 months at 10°c, stored seed can take longer[133]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. When the plants are 30cm or more tall, plant them out into their permanent positions in late spring or early summer, after the last expected frosts[K]. Most seedlings are male[126]. The seedlings are subject to damping off, they must be kept well ventilated[113]. Cuttings of softwood as soon as ready in spring in a frame[K]. Cuttings of half-ripe wood, July/August in a frame. Very high percentage[113]. Cuttings of ripe wood, October/November in a frame.

nwatta Prefers a sound loamy neutral soil[1, 200]. Succeeds in semi-shade but full sun is best for fruit production[200]. Prefers a sheltered position[200]. Plants are not fully hardy in much of Britain[219]. Young spring growth is susceptible to frost damage[160]. Fruits are formed on second year wood and also on fruit spurs on older wood[126], any pruning is best carried out in the winter[219]. This is a climbing plant, supporting itself by twining around branches etc[200]. A very ornamental plant[146], there are some named varieties developed for their edible fruit[183]. A polymorphic species, there are a number of sub-species[198]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

### 7.2.130 Anthriscus cerefolium

Chervil, Garden chervil

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.5 m hkuc

pchimhmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyixre7t hjonli

drutta Anthriscus cerefolium is a BIENNIAL growing to 0.5 m (1ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Condi-mentEdible leaves - raw in salads or used as a flavouring in

### 7.2.215 Citroncirus webberi

Citrange

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Citroncirus webberi is an evergreen Tree. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: The acid fruit can be used for drinks and marmalade[183, 200]. The fruit is 5 - 7cm in diameter[200].

tcanta RootstockThis species can be used as a rootstock for the sweet orange, conferring a greater tolerance to cold weather[183].

dwatta None known

propta The following notes are based on Citrus species. They are probably applicable here as well, even though this is a bi-generic hybrid, since any seed might be produced polyembryonically. The seed is best sown in a greenhouse as soon as it ripe after thoroughly rinsing it[164, 200]. Sow stored seed in March in a greenhouse[3]. Germination usually takes place within 2 - 3 weeks at 13°c. Seedlings are liable to damp off so they must be watered with care and kept well ventilated. The seed is usually polyembryonic, two or more seedlings arise from each seed and they are genetically identical to the parent but they do not usually carry any virus that might be present in the parent plant[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least three growing seasons before trying them outdoors. Plant them out in the summer and give them some protection from the cold for their first few winters outdoors. Cuttings of half-ripe wood, July/August in a frame. Layering in October.

nwatta Prefers a moderately heavy loam with a generous amount of compost and sand added and a very sunny position[1, 200]. When growing plants in pots, a compost comprising equal quantities of loam and leafmold plus a little charcoal should produce good results[260]. Do not use manure since Citrus species dislike it[260]. When watering pot plants it is important to neither overwater or underwater since the plant will soon complain by turning yellow and dying. Water only when the compost is almost dry, but do not allow it to become completely dry[260]. Reasonably cold resistant, dormant plants can tolerate temperatures down to about -10°c, especially if they are grafted onto a Poncirus trifoliata rootstock[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A group of hybrids of garden origin, Poncirus trifoliata x Citrus sinensis[183]. Generally, these hybrids combine the qualities of cold hardiness and bitterness from Poncirus trifoliata with the larger more orange-like fruits of Citrus sinensis[183]. They are occasionally cultivated for their edible fruit, but more usually for their use as a rootstock, there are some named varieties[183, 200]. 'Morton' has very juicy fruits and is cold resistant[200]. 'Rusk' is very juicy and much less bitter than most forms[200].

### 7.2.216 Scirpus validus

River Club-Rush

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.5 m hkuc

hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Scirpus validus is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves Pollen Root SeedEdible Uses: Root - raw or cooked[159, 161, 172, 183]. Rich in starch. The root contains a meagre amount of starch[193].

The sweet roots are eaten raw in mid summer[257]. The bruised young roots, when boiled in water, furnish a sweet syrup[183]. The rhizomes are 3 - 10mm in diameter[270]. Young shoots - cooked[55, 62, 85, 183]. The tender base of the stem is eaten raw in salads[183, 257]. The pollen is used in soups or mixed with flour and used in making bread[177, 183]. It is rich in protein. Seed[62, 85, 159, 183]. No further details are given but it is probably ground into a powder and used in making bread etc. The seed is small and rather fiddly to harvest and utilize.

tcanta Basketry WeavingThe stems are used in weaving and basket making[189, 257]. They are used to make good quality mats for use on the floor, for sleeping on and for making temporary partitions[257]. The stems are pulled off the plant rather than cut to ensure the maximum length of stem[257].

dwatta Astringent Diuretic HaemostaticThe root is astringent and diuretic[152]. The stem pith is haemostatic[257]. A poultice of the stem pith has been placed under a dressing in order to stop wounds bleeding[257].

propta Seed - sow in a cold frame as soon as it is ripe in a pot standing in 3cm of water. Only just cover the seed with soil[200]. The seed usually germinates fairly quickly. Prick out the plants when large enough to handle and plant out in their permanent positions in early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any wet to moisture retentive ground, pond margins and shallow water in full sun or shade[200].

### 7.2.217 Ribes bracteosum

Stink Currant

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 2.5 m hkuc

htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Ribes bracteosum is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 85, 101, 118]. Not very palatable[200]. The fruit can cause stomach upsets if eaten in large quantities[257]. The fruit has a mild blackcurrant flavour, though it is not so juicy, has a mealy texture and a slight bitterness[K]. It ripens in September and is acceptable in small quantities raw[K], it can also be used in pies, preserves etc and makes an excellent jam[177, 183, 257]. It can be dried and stored for winter use[177, 183]. Native North American Indians considered the fruit to be constipating and so would eat it with oil[256]. The fruit is about 5mm in diameter[200], it is produced on long racemes, making it much easier to harvest than most currants[K].

tcanta Miscellany NeedlesNone known

dwatta Laxative MiscellanyThe fruits can be eaten in quantity as a laxative[257]. An infusion of the stems has been given to children as a treatment for colds[257].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 2 to 5°c and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Requires a sunny position[111]. Hardy to about -20°c[200].

tuber is 3 - 5cm in diameter[266]. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog, woodland garden or a sheltered border in semi-shade[200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. Plants are nearly hardy in Britain, they normally succeed outdoors in the milder areas of the country[1]. Tubers should be planted about 15cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants multiply quickly once they are established[200]. Plants need protection from slugs[200]. This species has very large leaves, to 40cm long[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

## 7.2.212 Ribes californicum

Hillside Gooseberry

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta Ribes californicum is a deciduous Shrub. See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 161, 177, 257]. The fruit can also be made into preserves or can be dried for winter use[257].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold stratification at 1 to 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Requires a sunny position[11]. Hardy to about -20°C[200]. This species is closely related to *R. menziesii*[200]. A polymorphic species[71]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.213 Digitaria sanguinalis

Crab Grass, Hairy crabgrass

6 tlin 9 cyuc 2 kcak 2 tcan 1 dwat 0.5 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Digitaria sanguinalis* is an ANNUAL growing to 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female

organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - ground up and used as a flour[2, 57, 105]. It has excellent keeping qualities[74] and makes a fine white flour that can be used for semolina[74, 115].

tcanta Fodder PaperA fibre obtained from the plant is used in making paper[74]. Animals: Fodder/animal feed, Forage.

dwatta Emetic Ophthalmic VDA decoction of the plant is used in the treatment of gonorrhoea[218]. A folk remedy for cataracts and debility, it is also said to be emetic[178, 218].

propta Seed - best sown in situ in the spring[162]. Only just cover the seed.

nwatta Prefers a sandy soil[50]. Requires a warm sheltered position[162]. This species is occasionally cultivated, especially in Poland, for its edible seed. Special Features: Invasive.

## 7.2.214 Chusquea quila

Argentinian quila

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 5 m hkuc  
hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliws hpa7tmwatli xre7t hjonli

drutta *Chusquea quila* is an evergreen Bamboo growing to 5 m (16ft) by 2.5 m (8ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcakta Edible Parts: StemEdible Uses: Young shoots - cooked[25, 177].

tcanta Musical WoodThe canes are used in making musical instruments, plain furniture and fencing[139].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Very difficult[200]. Take divisions with at least four canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings.

nwatta Prefers a damp humus rich soil[200]. Prefers an open loam of reasonable quality, doing well on peat[11]. Likes plenty of moisture in the growing season[11]. Established plants are drought tolerant[25, 162, 195]. They require a position sheltered from cold north and east winds[11, 200]. A very hardy plant[25, 162], tolerating temperatures down to about -15°C[200]. Another report says that the plant is probably only hardy in the milder areas of the country[1]. It succeeds outdoors at Edinburgh Botanical Gardens[195] and is growing well at Kew[K]. This species is found further south in the world than any other species of bamboo, it grows in Chile as far south as latitude 47°south[195]. The rootstock is caespitose, new shoots are produced from late April and can grow 15cm overnight[25]. Plants take 2 - 3 years to settle down after being moved but are then quite fast growing[188]. This species is notably resistant to honey fungus[200]. Plants flower and produce seed annually in the wild without dying as a result of the flowering[162]. Plants of the cultivar 'Tenuis' have been observed to be flowering in 1994, this is the first record of this species flowering in the northern hemisphere[214].

cooked foods such as soups and stews[2, 14, 21, 27, 46, 61, 100, 244]. A mild aromatic flavour[183] that is suggestive of aniseed[238]. The leaves are often used as a flavouring, they form the basis of the seasoning 'fines herbes'[200] and are an essential ingredient of 'bouquet garni'[244]. The leaves should always be used fresh because the delicate flavour does not withstand drying or prolonged cooking[238, 244]. The leaves are ready for harvesting in about 8 weeks from sowing, the plant responds well to cut and come again harvesting[200]. The flowers are used as a seasoning[183]. The root is said to be edible[177, 183].

tcanta RepellentThe growing plant is said to repel slugs[238].

dwatta Digestive Diuretic Expectorant Ophthalmic Poulitice StimulantChervil is not widely used as a medicinal herb, though it is sometimes employed as a 'spring tonic' for cleansing the liver and kidneys, is a good remedy for settling the digestion and is said to be of value in treating poor memory and mental depression[238, 244, 254]. The fresh plant, harvested just before flowering, is digestive, diuretic, expectorant, poulitice and stimulant[9, 21, 201]. The juice is used in the treatment of dropsy, arthritis and chronic skin ailments[9]. The bruised leaves are used as a poultice for slow-healing wounds[9] and a warm poultice is applied to painful joints[268]. An infusion of the fresh leaves is also used as an eyewash to treat sore or inflamed eyes[244].

propta Seed - sow in situ in succession from February to October. The seed usually germinates in 2 - 3 weeks[200]. The February, September and October sowings should be made in a very sheltered warm and sunny position outdoors or under some protection such as a frame. Other sowings can be made in a position that has at least some shade from the midday sun since the plant runs to seed quickly if it gets too hot or the soil is dry[238]. The seed only remains viable for about a year[238].

nwatta Prefers a well-drained moisture retentive soil[200]. Plants dislike hot dry summers[200], it is best to give summer crops a cool shady position but winter crops require a sunny position[14, 18, 37, 52]. Tolerates a pH in the range 5.8 to 7.6. Plants are hardy to about -10°C[200]. Chervil is occasionally cultivated as a salad plant, especially in France[268]. There are some named varieties[183]. It can supply fresh leaves all year round from successional sowings, especially if given some protection in winter[238]. Although a biennial, it is usually cultivated as an annual[238]. It often self-sows when grown in a suitable position[18, 200]. Be careful if harvesting this plant from the wild because it is superficially similar to some poisonous species such as young plants of hemlock, *Conium maculatum*[244]. Chervil is an aromatic plant with pleasantly scented leaves[245]. It is said to be a good companion plant for growing with carrots and radishes[18, 201], the radishes becoming hotter and crisper[201]. It also grows well with dill and coriander[201]. When grown with lettuces it is said to protect them from aphids and ants, the plant is also said to repel slugs[238].

## 7.2.131 Vaccinium crassifolium

Creeping Blueberry

6 tlin 9 cyuc 3 kcak 2 tcan 0 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Vaccinium crassifolium* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 183]. The flavour is sweet but bland[43]. The fruit is about 4mm in diameter[200].

tcanta Plants can be grown as a ground cover, the cultivars 'Bloodstone' and 'Well's Delight' have been specially recommended[183, 200].

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored

seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Not fully hardy in Britain, it is best grown in the milder areas of the country and is reluctant to flower in colder areas[1, 11, 182]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Occasionally cultivated for its edible fruit, there are some named varieties. 'Well's Delight' grows only 12 - 20cm tall, forming a nearly solid evergreen carpet and is recommended as an ornamental low-maintenance ground cover plant[183]. The fruit has a slight aromatic flavour[183]. 'Bloodstone' is another cultivar that has been recommended for ground cover[200]. Plants in this genus are notably resistant to honey fungus[200]. The plant is heat tolerant in zones 7 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet with a limited spread [1-2].

## 7.2.132 Umbilicus rupestris

Pennywort

6 tlin 9 cyuc 3 kcak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws hpa7tmwatli fyfmxre7t hjonli

drutta *Umbilicus rupestris* is an evergreen Perennial growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects? Self. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 105, K]. A very acceptable mild flavour in the winter and early spring, they can be used in quantity in salads at this time[K]. The leaves become rather stronger-tasting in the summer and are not so pleasant then[K].

tcanta None known

dwatta Analgesic Diuretic Epilepsy PouliticeThe leaves are mildly analgesic[7]. The juice and extract of the plant have an old reputation for the treatment of epilepsy[4]. The leaves are also made into a poultice and used in the treatment of piles, slight burns and scalds[4, 7]. A decoction of the leaves is considered to be cooling and diuretic and the juice taken inwardly is said to be excellent for treating inflammations of the liver and spleen[4].

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. Division in spring. Very easy, pant

them straight out into their permanent positions. Leaf cuttings[200].

nwatta An easily grown plant, succeeding in any near neutral, gritty, moisture retentive but well-drained soil in sun or light shade[200]. Plants are often found growing on walls, even succeeding on old brick and mortar walls[K] Plants are hardy to about -15°c[200]. A very attractive plant for the rock garden[53], the leaves often stay green all winter[4].

## 7.2.133 Aesculus californica

Californian Buckeye, California Horsechestnut  
6 tin 10 cyuc 3 kcaak 0 tcan 1 dwat 12 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyk hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Aesculus californica is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[22, 46, 63, 92, 94, 95]. It can be dried, ground into a powder and used as a gruel[2]. The seed contains about 23% protein and has an agreeable taste[213]. The seed is large, and can be up to 5cm in diameter[82]. It is often produced abundantly in the warmer areas of Britain and is easily harvested[K]. This was the most commonly used *Aesculus* species in N. America[213]. It does, however, contain poisonous saponins (see the notes above on toxicity) and so needs careful preparation before being eaten. The seed needs to be leached of these toxins before it becomes safe to eat - the Indians would do this by slow-roasting the nuts (which would have rendered the saponins harmless) and then cutting them into thin slices, putting them into a cloth bag and rinsing them in a stream for 2 - 5 days[213]. Most of the minerals etc would also have been leached out by this treatment[K].

tcanta Friction sticks Soap WoodThe seed is rich in saponins, these are used as a soap substitute[169]. The saponins can be easily obtained by chopping the seed into small pieces and infusing them in hot water. This water can then be used for washing the body, clothes etc. Its main drawback is a lingering odour of horse chestnuts[K]. Wood - soft, light, very close grained[82]. Of no value as a lumber[229]. The wood was used as friction sticks for making fire by the North American Indians[257].

dwatta Expectorant Odontalgic SalveThe seed contains saponins and can be used as an expectorant[94]. The crushed fruit is applied as a salve on haemorrhoids[257]. A decoction of the bark is used in the treatment of toothache and loose teeth[257].

propta Seed - best sown outdoors or in a cold frame as soon as it is ripe[11, 80]. The seed germinates almost immediately and must be given protection from severe weather[130]. The seed has a very limited viability and must not be allowed to dry out. Stored seed should be soaked for 24 hours prior to sowing and even after this may still not be viable[80, 113]. It is best to sow the seed with its 'scar' downwards[130]. If sowing the seed in a cold frame, pot up the seedlings in early spring and plant them out into their permanent positions in the summer.

nwatta Landscape Uses:Erosion control, Specimen. Prefers a deep loamy well-drained soil but is not too fussy[11]. Requires a position in full sun[200]. Prefers dry sunny locations[126]. Although fairly hardy throughout Britain, it grows best in areas where winter temperatures do not fall below -10°c[200]. A moderately fast-growing and long-lived tree in the wild[229], in Britain it grows best in eastern and south-eastern England. Plants thrive at Kew[11]. Most members of this genus transplant easily, even when fairly large[11]. Special Features:North American native, Flowers have an unpleasant odor, Blooms are very showy.

## 7.2.134 Mahonia trifoliolata

Mexican Barberry, Algeria  
6 tin 9 cyuc 3 kcaak 4 tcan 2 dwat 2 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyk hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Mahonia trifoliolata is an evergreen Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: CoffeeFruit - raw or cooked[2, 3, 85]. An acid flavour but nice, especially when added to porridges or muesli[K]. A subtle tart flavour, it is pleasant to eat raw[183]. Unfortunately there is relatively little flesh and a lot of seeds[K]. The fruit is also used to make preserves[149, 183]. The roasted seed is a coffee substitute[149].

tcanta Dye Hedge Hedge Ink TanninA yellow dye is obtained from the inner bark of the stem and roots[46, 61, 149, 181]. It is green according to another report[168]. An ink is made from the wood[46, 61]. Dark green, violet and dark blue-purple dyes are obtained from the fruit[168]. A green dye is obtained from the leaves[168]. Makes a good hedge[149]. The wood is a source of tannin[46].

dwatta Antibacterial Antitumor Dysentery TonicBerberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[181, 213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with *Glycyrrhiza* species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a greenhouse[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°c. Prick out the seedlings when they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant them out in late spring or early summer and consider giving them some protection from the cold for their next winter. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta Unlike most members of the genus, this species requires a dry, perfectly drained position in full sun, a gritty slightly acid soil is best[200]. It does well in a hot, dry position[167]. Succeeds in a good garden soil[11]. The form in general cultivation in Britain (*M. trifoliolata* glauca. I.M.Johnst.) comes from the southern part of its range[67], it is only hardy on a sunny wall in this country or as a free-standing shrub in the very mildest areas[3, 11]. The young growth in spring can be damaged by late frosts. A good bee plant[149]. Resistant to honey fungus[88].

## 7.2.135 Phyllostachys praecox

Violet Bamboo  
6 tin 10 cyuc 3 kcaak 3 tcan 0 dwat 6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikliws  
hpa7tmwatli xre7t hjonli

drutta Phyllostachys praecox is an evergreen Bamboo growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade

given some protection from winter cold for their first winter or two outdoors. Layering in early spring[200].

nwatta Landscape Uses:Espalier, Firewood, Pest tolerant, Aggressive surface roots possible, Screen, Seashore, Specimen, Street tree. Best grown in a warm position in a moderately rich free soil of an open texture[1]. Tolerates moderately limy soils[200, 202] so long as they are deep and rich in humus[188]. The branches are brittle so a sheltered position is required[200]. Another part of the same book says that this species is fairly wind-resistant[200]. Succeeds in full sun or semi-shade[219]. Plants are hardy to about -10°c[200]. The fleshy roots are easily damaged and any transplanting is best done during a spell of mild moist weather in late spring[182]. A very ornamental plant[1], a number of named forms have been developed[200]. The flowers are very large (up to 25cm across) and have a delicious and very powerful scent[202, 245]. This is perhaps the most strongly scented flower in the world[245]. They can be produced in trees as young as 10 years old[229]. The form 'Exmouth Variety' (also known as elliptica) produces its flowers when younger than the species, these flowers have a refreshing lemon scent[245]. There is no main flush of flowering, instead the flowers open intermittently throughout the summer[K]. Plants do not normally need pruning, any cutting out of dead wood etc is best carried out in July[219]. Special Features: Attracts birds, Attractive foliage, North American native, Fragrant flowers, Attractive flowers or blooms.

## 7.2.209 Pistacia atlantica

Betoum, Mt. Atlas mastic tree, Mount Atlas Mastic  
6 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 20 m hkuc  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikliws  
hpa7tmwatli nyanhjen hjonli

drutta Pistacia atlantica is a deciduous Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 9. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit OilEdible Uses: Gum OilFruit - raw[61, 177]. A turpentine flavour[183]. The fruit is about 8mm long and 6mm wide and contains a single seed[200]. An excellent edible oil is obtained from the seed[183].

tcanta Dye Gum Ink Oil Resin Rootstock Tannin WoodUsed as a rootstock for *P. vera*, the pistachio nut[183]. A resin is obtained from the tree[117]. No more details. A gum is obtained from the tree. It is used medicinally[93]. It is possible that the gum and the resin are the same thing[K]. Tannin is obtained from galls that develop on the tree as a result of a fungus. It is used to make an ink and a dye[61]. The leaves contain 22.2% tannin[223]. The wood is useful[46].

dwatta AntisepticAntiseptic[93].  
propta Pre-soak the seed for 16 hours in alkalinized water[78], or for 3 - 4 days in warm water[1], and sow late winter in a cold frame or greenhouse[78, 113]. Two months cold stratification may speed up germination, so it might be better to sow the seed in early winter[113]. The germination is variable and can be slow. Prick out the seedlings into individual pots when they are large enough to handle and grow on the plants for at least their first winter in a greenhouse. Plant out into their permanent positions in early summer and consider giving some protection from winter cold for their first year or two outdoors[K]. Cuttings of half-ripe wood from juvenile trees, July in a frame[113]. Layering.

nwatta Requires a sunny position in a deep well-drained light soil[200]. Succeeds in dry soils. This species is not very cold-hardy in Britain[1], though it can succeed outdoors in the mildest areas of the country. This plant is sometimes grown near *P. vera*, the pistachio, as a pollinator[183]. Any pruning that needs to be done is best carried out in the spring[238]. Plants are prone to fungal root rots[200]. Dioecious, male and female plants must be grown if seed is required. Special Features:Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 7.2.210 Lactuca serriola

Prickly Lettuce  
6 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws  
hpa7tmwatli fyikre7t hjonli

drutta Lactuca serriola is a BIENNIAL growing to 1.5 m (5ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil OilEdible Uses: Oil OilYoung leaves - raw or cooked[13, 55, 62]. A bitter flavour[85]. The young tender leaves are mild and make an excellent salad[183, 217], but the whole plant becomes bitter as it gets older, especially when coming into flower[K]. As a potherb it needs very little cooking[183]. Large quantities can cause digestive upsets[62]. Young shoots - cooked. Used as an asparagus substitute[13]. An edible oil is obtained from the seed[46, 61, 105]. The oil must be refined before it is edible[114]. A pleasant flavour[114, 183].

tcanta Oil OilThe seed contains 35.2% of a semi-drying oil[240]. It is used in soap making, paints, varnishes etc[114].

dwatta Anodyne Antipyretic Diuretic Homeopathy Hypnotic Narcotic Sedative UrinaryThe whole plant is rich in a milky sap that flows freely from any wounds. This hardens and dries when in contact with the air[4]. The sap contains 'lactucarium', which is used in medicine for its anodyne, antispasmodic, digestive, diuretic, hypnotic, narcotic and sedative properties[9, 21, 46, 165, 192, 213, 238]. Lactucarium has the effects of a feeble opium, but without its tendency to cause digestive upsets[4], nor is it addictive[7]. It is taken internally in the treatment of insomnia, anxiety, neuroses, hyperactivity in children, dry coughs, whooping cough, rheumatic pain etc[238]. Concentrations of lactucarium are low in young plants and most concentrated when the plant comes into flower[238]. It is collected commercially by cutting the heads of the plants and scraping the juice into china vessels several times a day until the plant is exhausted[4]. This species does not contain as much lactucarium as *L. virosa*[4]. An infusion of the fresh or dried flowering plant can also be used[9]. The plant should be used with caution, and never without the supervision of a skilled practitioner. Even normal doses can cause drowsiness whilst excess causes restlessness[238] and overdoses can cause death through cardiac paralysis[7, 9]. The fixed oil from the seeds is said to possess antipyretic and hypnotic properties[240]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of chronic catarrh, coughs, swollen liver, flatulence and ailments of the urinary tract[9].

propta Seed - sow spring in situ and only just cover the seed. Germination is usually fairly quick.

nwatta Prefers a light sandy loam in a sunny position[1, 13]. The wild lettuce is cultivated for the oil in its seed in Egypt[46, 61]. A compass plant, the top leaves align north-south[200].

## 7.2.211 Arisaema costatum

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliws  
hpa7tmwatli dyat hjonli

drutta Arisaema costatum is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. It is boiled, dried and then ground into a powder[2, 177]. The

cially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -10°c[200]. This species used to be cultivated as a culinary herb in the herb garden but it has now fallen into disuse[2]. The flowers are rich in nectar and are very attractive to honey bees[89, 148, 200, 238]. The growing plant is a beneficial companion for most plants[54]. The plant is powerfully pungent when handled[245]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 7.2.206 Yucca filifera

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli hgtakuyuctup hwicli hyhrasljutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Yucca filifera is an evergreen Shrub growing to 10 m (32ft 10in). See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Flowers Fruit StemEdible Uses: Fruit - raw or cooked. Flowers - raw or cooked. Delicious raw, they can also be dried, crushed and used as a flavouring[164]. Flowering stem - cooked and used like asparagus[164].

tcanta Fibre SoapA fibre obtained from the leaves is used for making ropes, baskets and mats[82, 169]. The roots are rich in saponins and can be used as a soap substitute[82].

dwatta None known  
 propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°c. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots in a greenhouse until established[78]. Division of suckers in late spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the following spring.

nwatta Thrives in any soil but prefers a sandy loam and full exposure to the south[11]. Can succeed in light shade[K]. Plants are hardier when grown on poor sandy soils[200]. Established plants are very drought resistant[200]. Hardy to at least -5°c according to one report[200], whilst another says that it is hardy to about -30c[164]. The leaves can be damaged by strong winds[11]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in about four years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]

## 7.2.207 Ehretia ovalifolia

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 12 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Ehretia ovalifolia is a deciduous Tree growing to 12 m (39ft 4in). See above for USDA hardness. It is

hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit. No more details. Young buds and leaves[105, 177]. No more details.

tcanta WoodNone known  
 dwatta None known  
 propta Seed - we have no information on this species but suggest sowing it as soon as it is ripe in a greenhouse. Sow stored seed in late winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame.

nwatta Prefers a moderately fertile well-drained sandy loam in a sunny position[200]. Requires a sheltered position[299]. Plants are shade tolerant in continental climates but they require more sun in maritime areas in order to ripen the wood[200]. Rich fertile soils tend to encourage soft sappy growth which is then subject to frost damage over winter[200]. Young trees are tender in Britain but they become perfectly hardy as they grow older[11]. The young growth in spring is frost-tender[K]. Closely allied to *E. acuminata* and included in that species by some botanists[11]. A tree was 10 metres tall at Bath botanical gardens in 1989[K]. The flowers, which are produced on the ripened wood of the previous season's growth, have a soft sweet perfume[245].

## 7.2.208 Magnolia grandiflora

Southern Magnolia, Bull Bay, Large-flowered Magnolia, Southern Magnolia  
 6 tlin 10 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis hpa7tmwatli dyatxre7t hjonli

drutta Magnolia grandiflora is an evergreen Tree growing to 10 m (32ft) by 10 m (32ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to September, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Beetles. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FlowersEdible Uses: Condiment-The flowers are pickled in some parts of England and are considered to have an exquisite flavour[2, 183]. They are also said to be used as a spice and a condiment[183].

tcanta Essential Shelterbelt WoodA fairly wind-tolerant tree, it can be used in shelterbelt plantings[200]. An essential oil is obtained from the flowers[240]. Wood - hard and fairly heavy, but weak and not durable[227]. White when first cut, it turns brown on exposure to air[229]. It is used in limited amounts for fuel, baskets, crates, woodenware and furniture[82, 227].

dwatta Diaphoretic Hypotensive Malaria Salve Stimulant TonicThe bark is diaphoretic, stimulant, tonic[46, 61, 240]. It is used in the treatment of malaria and rheumatism[240]. A decoction has been used as a wash and a bath for prickly heat itching[257]. The decoction has also been used as a wash for sores and as a steam bath for treating dropsy[257]. An alcoholic extract of the plant reduces the blood pressure, produces a slight acceleration in respiration but has no action on the heart[240].

propta Seed - best sown as soon as it is ripe in a cold frame. Stored seed must be kept cold over the winter and should be sown in late winter in a cold frame[200]. The seed usually germinates in the spring but it can take 18 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least their first winter. They can be planted out into their permanent positions when they are more than 15cm tall, though should be well mulched and

(deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Shoots StemEdible Uses: Young shoots - cooked. A delicious flavour[266]. This is one of the first species to be ready to eat in the spring, the young shoots are usually boiled in at least one change of water. The shoots, which are 4 - 6cm in diameter[266], are harvested in the spring when they are about 8cm above the ground, cutting them about 5cm below soil level.

tcanta A recommended species for producing canes. Agroforestry Uses: This is a good companion species to grow in a woodland because the plants have shallow root systems that do not compete with deep tree roots[195 ].

dwatta None known  
 propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Divisions from the open ground do not transplant well, so will need careful treatment and nurturing under cover in pots until at least late spring[238]. Division is best carried out in wet weather and small divisions will establish better than large clumps[238]. Another report says that you can take large divisions from established clumps and transfer them straight to their permanent positions, misting or drenching them frequently until they are established[200]. Basal cane cuttings in spring.

nwatta Cultivated in the warm temperate and subtropical regions of southern China. In cultivation outside of China it has withstood temperatures down as low as -15°c for short periods. Succeeds in full sun and in partial shade. Species in this genus generally tolerate a wide range of soils and sites, though they prefer a damp humus-rich soil in sun or semi-shade[1

1, 200  
 1. They grow best in a position sheltered from cold winds[11  
 1. Plants are generally not very tolerant of dry conditions[1

1. Bamboos have an interesting method of growth. Each plant produces a number of new stems annually - these stems grow to their maximum height in their first year of growth, subsequent growth in the stem being limited to the production of new side branches and leaves. In the case of some mature tropical species the new stem could be as much as 30 metres tall, with daily increases in height of 30cm or more during their peak growth time. This makes them some of the fastest-growing species in the world[K

1. Bamboos in general are usually monocarpic, living for many years before flowering, then flowering and seeding profusely for a period of 1 - 3 years before usually dying. This pattern can vary - sometimes flowering is sporadic, with plants flowering annually and not dying; at other times it is gregarious with all the plants in a specific species coming into flower at the same time. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 7.2.136 Camassia scilloides

Atlantic Camas  
 6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Camassia scilloides is a BULB growing to 0.6 m (2ft). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - raw or cooked[257]. The bulb was an important food for several native North American Indian tribes who used it in a variety of ways[257]. It can be baked or dried and made into a powder which can be used as a thickener in stews or as an additive to cereal flours when making bread, cakes etc[62, K]. The bulb is about 4cm long and 15mm wide[235].

tcanta None known  
 dwatta None known  
 propta Seed - best sown as soon as it is ripe in a cold frame[134]. The seed can also be sown in a cold frame in spring[134]. It usually germinates in 1 - 6 months at 15°c, but it can be erratic[138]. Sow the seed thinly so that it does not need to be thinned and allow the seedlings to grow on undisturbed for their first year. Give an occasional liquid feed to ensure that the plants do not become nutrient deficient. When the plants are dormant in late summer, pot up the small bulbs putting 2 - 3 bulbs in each pot. Grow them on for another one or two years in a cold frame before planting them out when dormant in late summer. Offsets in late summer. The bulb has to be scored in order to produce offsets.

nwatta Succeeds in almost any soil[42]. Grows well in heavy clay soils. Prefers a rather heavy loam[1] that has plenty of moisture in spring but does not remain wet over the winter[138, 200]. Dislikes dry soils[200]. Tolerates partial shade[138, 200]. Plant bulbs 7 - 10cm deep in early autumn and then leave them undisturbed.

## 7.2.137 Lilium bulbiferum

Fire Lily, Orange lily  
 6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Lilium bulbiferum is a BULB growing to 1.2 m (4ft). See above for USDA hardness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. Sweet and mealy[177], they make very fair eating and can be used as a potato substitute[2].

tcanta None known  
 dwatta None known  
 propta Seed - delayed hypogaeal germination[130]. Best sown as soon as ripe in a cold frame, it should germinate in spring[143]. Stored seed will require a warm/cold/warm cycle of stratification, each period being about 2 months long[163]. Grow on in cool shady conditions. Great care should be taken in pricking out the young seedlings, many people leave them in the seed pot until they die down at the end of their second years growth. This necessitates sowing the seed thinly and using a reasonably fertile sowing medium. The plants will also require regular feeding when in growth. Divide the young bulbs when they are dormant, putting 2 - 3 in each pot, and grow them on for at least another year before planting them out into their permanent positions when the plants are dormant[K]. Division with care in the autumn once the leaves have died down. Replant immediately[200]. Bulbils - gather in late summer when they start to fall off the stems and pot up immediately. Grow on in a greenhouse until large enough to go outside[163]. Bulb scales can be removed from the bulbs in early autumn. If they are kept in a warm dark place in a bag of moist peat, they will produce bulblets. These bulblets can be potted up and grown on in the greenhouse until they are large enough to plant out[200].

nwatta Prefers an open free-draining humus-rich loamy soil with its roots in the shade and its head in the sun[200]. Succeeds in ordinary garden soil[1, 143] and in calcareous soils[90, 200]. Prefers summer shade[200]. Stem rooting, the bulbs should be planted 15cm deep[43, 143, 200]. Early to mid autumn is the best time to plant out the bulbs in cool temperate areas, in warmer areas they can be planted out as late as late autumn[200]. This is one of the easiest lilies to grow[47], it is cultivated for its edible bulb in Japan[2]. The plant should be protected against slugs in early spring. If the

shoot tip is eaten out the bulb will not grow in that year and will lose vigour[200]. The typical form of this species forms bulbils on its stems[200]. The sub-species *L. bulbiferum* croceum does not normally produce bulbils[188].

### 7.2.138 Mahonia confusa

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 1.5 m hkuc pcmihmtt cyutli tcup hwicli hyishrasljutnyvikfriphpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Mahonia confusa is an evergreen Shrub growing to 1.5 m (5ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from October to December, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acidic, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. An acid but nice flavour and fairly juicy, it makes a pleasant nibble and is nice in other dishes, especially when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. The fruit ripens in early to mid spring, a time when little other fresh fruit is available in the garden[K].

tcanta None known

dwatta Cancer Dysentery Febrifuge OdontalgicThe leaf is used in the treatment of cancer[218]. A decoction of the root is febrifuge and odontalgic[218]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumor activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a greenhouse[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant them out in late spring or early summer and consider giving them some protection from the cold for their next winter. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta An easily grown shrub, it thrives in any good garden soil[11] including heavy clays. Prefers a semi-shaded woodland position in a damp, slightly acid to neutral humus-rich soil[200]. Plants can tolerate temperatures down to about -10°C[260]. Only introduced to Britain in 1980, the plant is growing so well here that within six years it was being distributed commercially from home-produced seedlings[11]. The young growth in spring can be damaged by late frosts. Plants are very tolerant of pruning and can be cut right back into old wood if they have outgrown their welcome[182]. Closely related to *M. fortunei*[11]. It hybridizes freely with other members of this genus. The flowers are very sweetly scented[184].

### 7.2.139 Quercus virginiana

Live Oak

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 20 m hkuc hmimhmtt cyutli kyuctcup hwicli jltunykifriphpa7tli flatprikliwshom hpa7tmwatli hjonli

drutta Quercus virginiana is an evergreen Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in

leaf all year, in flower in April. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: Coffee OilSeed - raw or cooked[63, 161, 171]. Low in tannin, it has a sweet flavour[82]. The seed is usually produced in clusters of 3 - 5 and is about 25mm long and 10mm wide[82, 200]. It is about 12mm long according to another report[227]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. An edible oil obtained from the seed is used for cooking[149, 161, 177]. The roasted seed is a coffee substitute.

tcanta Oil Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. The bark is a commercial source of tannin[149, 227]. Dyes of various colours can be obtained from the bark[257]. Wood - very heavy, hard, strong, tough, close grained but difficult to work. It weighs 59lb per cubic foot. It is used for making hubs, cogs, shipbuilding etc[46, 61, 82, 149, 171, 227]. A very good fuel[229].

dwatta Analgesic Antihæmorrhoidal Astringent DysenteryThe bark is astringent[257]. A decoction has been used in the treatment of dysentery[257]. A decoction of the wood chips or the bark has been applied externally as an astringent analgesic to treat aches and pains, sores and hæmorrhoids[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of hæmorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of shade[200]. Trees can stand considerable salinity, often growing close to the sea[227]. They tolerate moderate exposure, surviving well but being somewhat stunted[200]. This species seems to be susceptible to soil types, producing dwarf forms and diverse leaf forms under certain conditions[227]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[11, 200]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Abundant crops are usually produced in the wild[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Plants are deciduous when growing in cold climates[11]. Plants in this genus are notably resistant to honey fungus[200].

### 7.2.204 Ophrys bertolonii

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.4 m hkuc hmimhmtt cyutli tcup hwicli hrasljutnyvik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Ophrys bertolonii is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes

into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

### 7.2.205 Thymus capitatus

Headed Savory, Thymus

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc hpa7tli kyuctcup hwicli hrasljut hpa7tli prikliwis hpa7tmwatli xre7t hjonli

drutta Thymus capitatus is an evergreen Shrub growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Condiment TeaThe plant is sometimes used as a condiment[183]. An essential oil from the plant is used for flavouring baked goods, condiments, beverages, ice creams etc. It is called 'Spanish oregano oil'[183, 238]. Leaves - raw in salads or added as a flavouring to cooked foods[2]. An aromatic tea is made from the leaves. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil, known as 'Spanish oregano oil', obtained from the leaves is also used in perfumery and soaps, as a mouth wash, medicinally etc[46, 57, 89, 100, 200, 238].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238]. The essential oil should not be used in aromatherapy because it is highly irritant to the mucous membranes[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Prefers a light, well-drained calcareous soil and a sunny position[200]. Thymes dislike wet conditions, espe-



says that they are hardy to about -10°C, and that the stem tips are often killed back in the winter though the plant soon recovers[202]. Climbs by means of twining[182]. It is self-supporting[200] and fast-growing[202]. Any pruning is best carried out in late winter and early spring[202]. A very ornamental plant[1], there are some named varieties[200]. The flowers are very fragrant[202] and the plant is sometimes cultivated for the essential oil in its flowers, the sub-species *J. officinale grandiflorum* (L.) Kobuski. is used[171]. Flowers are produced on the current year's growth and also on older wood[202]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.201 Artemisia tripartita

Threetip Sage Brush, Wyoming threetip sagebrush  
6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.8 m hkuc  
htuc cyutli hgatkuyctcup hwicli hyhshrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Artemisia tripartita is a SHRUB growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves SeedEdible Uses: Leaves[61]. No further details are given. Seed[46, 61, 105, 161, 257]. No further details are given, but the seed is very small and fiddly to use[K].

tcanta TinderThe bark is used as a tinder when making fires[257].

dwatta Diaphoretic VulneraryAn infusion of the roots, or a decoction of the leaves and branches, is used in the treatment of colds, sore throats, tonsillitis, headaches etc[257]. An infusion of the plant is used as a wash for wounds caused by the removal of corns[257].

propta Seed - surface sow from late winter to early summer in a greenhouse in a very free-draining soil, but do not allow it to dry out. The seed usually germinates in 1 - 2 weeks in a warm greenhouse[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter, planting them out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame. Very slow to root[111] Division in spring or autumn. Layering[164].

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Succeeds in most soils including those of low fertility[164]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Established plants are very drought tolerant[200]. Plants resprout freely after a fire[60, 164]. The sub-species *A. tripartita rupicola* is a dwarf form growing only 15cm tall, whilst *A. tripartita tripartita* grows to 1.8 metres[164]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.202 Quercus infectoria

Aleppo Oak, Oak  
6 tlin 8 cyuc 2 kcaak 0 tcan 2 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus infectoria is an evergreen Shrub growing to 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by

thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Ink TanninAn ink is made from the tannin-rich galls[171]. The galls are caused by the activity of the Cynipid fly *Cynips tinctoria*[223]. The galls contain 36 - 58% tannin[223]. An extract of the galls is mixed with ferrous sulphate together with a gum and colouring in order to make the ink[171]. We are not sure if the galls are meant to be used before or after the insect has left them[K].

dwatta Astringent Dysentery EczemaThe bark and acorns are astringent[240]. They are used in the treatment of intertrigo, impetigo and eczema[240]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Specimen. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Not North American native, Inconspicuous flowers or blooms.

## 7.2.203 Vaccinium arboreum

Farkleberry  
6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium arboreum is an evergreen Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Dry and slightly astringent but with a pleasant flavour[82]. Dry and insipid according to another report[183] whilst another says that it is dry, sweet and mealy[227] and yet another says that it is bitter and inedible[200]. The fruit is about 6mm in diameter[200].

tcanta Rootstock Tannin WoodSaid to be an excellent rootstock for 'Rabbiteye' blueberries (*V. ashei*) [183]. Tannin is obtained from the bark and root[82, 227]. Wood - heavy, hard, very close grained. It weighs 48lb per cubic foot. Used for making tool handles and other small articles[82, 227].

dwatta Astringent DysenteryThe berries, root-bark and leaves are very astringent and have been used internally in the treatment of diarrhoea, dysentery etc[4, 82, 229]. The infusion is valuable in treating sore throats, chronic ophthalmia, leucorrhoea etc[4].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored

## 7.2.140 Rheum palmatum

Turkey Rhubarb, Chinese Rhubarb - Da Huang, Chinese rhubarb

6 tlin 9 cyuc 3 kcaak 2 tcan 5 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Rheum palmatum is a PERENNIAL growing to 3 m (9ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Leaf stem - raw or cooked[2, 7, 105, 183]. The stem is superior in flavour to the common rhubarb and quite tender[2]. An acid flavour, it is sometimes used as a cooked fruit substitute[K].

tcanta Fungicide InsecticideAn insect spray is made from the leaves[20]. This spray is also said to help prevent clubroot of brassicas[20]. The cultivar 'Atrosanguineum' can be used as a ground cover plant in a sunny position[188]. Other forms can also be used, they are best planted about 1.8 metres apart each way[208].

dwatta Anticholesterolemic Antiseptic Antispasmodic Antitumor Aperient Astringent Chologogue Demulcent Diuretic Homeopathy Laxative Purgative Stomachic TonicChinese rhubarb, called Da Huang in China, has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[238]. It has a safe and gentle action, safe even for children to use[254]. The plant is also part of a North American formula called *essiac* which is a popular treatment for cancer. Its effectiveness has never been reliably proven or disproven since controlled studies have not been carried out. The other herbs included in the formula are *Arctium lappa*, *Ulmus rubra* and *Rumex acetosella*[254]. The root is anticholesterolemic, antiseptic, antispasmodic, antitumor, aperient, astringent, chologogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 7, 9, 21, 91, 171, 176, 238]. The roots contain anthraquinones, which have a purgative effect, and also tannins and bitters, which have an opposite astringent effect[244]. When taken in small doses, it acts as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232, 244]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Rheum palmatum* for constipation (see [302] for critics of commission E).

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Hardy to at least -15°C[200]. A very ornamental plant[1], there is at least one named variety[183]. Hy-

bridizes freely with other members of this genus[200]. The sub-species *R. palmatum tanguticum* is cultivated as a medicinal plant in China[61, 244], it was at one time a popular purgative in Europe[50]. Plants in this genus seem to be immune to the predations of rabbits[233]. Turkish rhubarb is a good companion plant for columbine (*Aquilegia spp*) [20]. The plant is heat tolerant in zones 9 through 1. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2].

## 7.2.141 Quercus emoryi

Black Oak, Emory oak  
6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 12 m hkuc  
hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus emoryi is an evergreen Tree growing to 12 m (39ft 4in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - raw or cooked[257]. A sweet taste[63, 85, 161], it is an important item of food for the Indians in S. Arizona and northern Mexico and is sold in the local markets there[46, 82, 85]. The seed is up to 2cm long and 1cm thick[82, 200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. If the seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Fodder Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - heavy, hard, strong, brittle, close grained[82]. Of little value commercially, though it is an important fuel in its native range[229].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left

in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Fodder: Mast Management: Standard Staple Crop: Balanced carb Wild Staple CropPrefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A slow-growing tree in its native range[229]. Seed production is cyclical, with a year of high production followed by a few years of low production. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.142 Brassica rapa perviridis

Mustard Spinach  
6 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli hgattucp hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli fyixre7t hjonli

drutta Brassica rapa perviridis is a BIENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcaakta Edible Parts: Flowers LeavesEdible Uses: Leaves - raw or cooked[206]. The flavour is a happy compromise between the blandness of cabbages and the sharpness of the oriental mustards[206]. The plant can be eaten at any stage from seedling to mature plant[206]. Flowering stems - raw or cooked[206]. Sweet and succulent, but becoming hotter as the plant matures[206].

tcanta None known  
dwatta None known  
propta Seed - sow in situ April to September[206]. Some varieties can also be sown in a cold greenhouse in late autumn, winter or early spring to provide leaves overwinter and in late spring.

nwatta Succeeds in full sun in a moisture-retentive well-drained fertile preferably alkaline soil[200, 206]. Prefers a cool moist reasonably fertile soil[52]. The plant is somewhat deeper rooted than many of the oriental brassicas and is more tolerant of drought, though it grows best if it is not short of water[206]. Mustard spinach is widely cultivated in the Orient for its edible leaves, there are many named varieties[206]. It takes 55 - 80 days for plants to reach maturity from sowing[206]. This is a very hardy plant, although knocked back, it has withstood temperatures down to about -14°C and can be cropped for most of the year[206]. It is much less likely to bolt from a spring sowing and is fairly resistant to summer heat[206].

## 7.2.143 Mahonia pumila

Dwarf Barberry  
6 tin 9 cyuc 3 kcaak 3 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli hgatkuyctucp hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Mahonia pumila is an evergreen Shrub growing to 0.3 m (1ft) by 2 m (6ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. We have seen no reports of edibility for this species, but it is certainly not poisonous. The fruit is likely to have an acid flavour and be suitable for making jams, jellies etc. The fruit is about 10mm in diameter[200].

tcanta DyeA yellow dye is obtained from the inner bark of the stem and roots[155, 257]. It is green[168]. Dark green, violet and dark blue-purple dyes are obtained from the fruit[168]. A green dye is obtained from the leaves[168]. This species forms suckers freely and should make a good dense ground cover in a sunny position[11].

dwatta Antibacterial Antitumor Blood tonic Dysentery TonicA decoction of the roots is used as a blood tonic and as a treatment for coughs[257]. Berberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Liquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. 'Green' seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn.

nwatta An easily grown plant, it thrives in any good well-drained garden soil[11], preferring one on the dryish side. Prefers a sunny position[11], but also succeeds in the light shade of trees[K]. This species is hardy to about -15°C if growing in a sheltered position[184]. Established plants sucker freely and form quite dense thickets[200]. Resistant to honey fungus[88].

## 7.2.144 Castanea alnifolia

Bush Chinkapin  
6 tin 9 cyuc 3 kcaak 2 tcan 0 dwat 1 m hkuc  
htut cyutli hgatkuyctucp hwicli hyishrasjltunyk hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Castanea alnifolia is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[105, 177]. Of excellent quality[183]. The seed is small but it is sweet and larger than C. pumila[11, 183] though produced less abundantly[11]. Eaten raw, there is a distinct astringency, especially if the fleshy inner skin beneath the outer shell of the seed is not removed[K]. When cooked, however, and especially when baked, the seed becomes much sweeter and has a floury texture[K]. It then makes an excellent food and can be used as a staple food in much the same way as potatoes or cereals[K]. The burs have less prickles, making it easier to harvest the seed[183].

tcanta TanninThe bark, leaves, wood and seed husks all contain tannin.

dwatta None known  
propta Seed - where possible sow the seed as soon as it is ripe in a cold frame or in a seed bed outdoors[78]. The seed must be protected from mice and squirrels. The seed has a short viability and must not be allowed to become dry. It can

dwatta Antibacterial Antiphlogistic Depurative FebrifugeAntibacterial, antiphlogistic[174]. There are growth-promoting substances in the leaves[174]. The whole plant is depurative, febrifuge and suppurative[147, 218]. Its use promotes the drainage of pus[147]. A decoction is used in the treatment of boils and abscesses, poisonous snakebites, otitis media, acute attacks of convulsions and haematemesis[147]. The leaf juice is applied to aching ears, abscesses and inflammations[218].

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in the spring. Surface sow, or only just cover the seed, and make sure that the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Alpine garden, Container, Ground cover, Massing, Rock garden, Woodland garden. Prefers a cool position in a moist humus-rich soil[1]. Prefers an acid soil[200]. Thrives on heavy soils in the milder areas of the country[208]. Usually thrives in a poor soil with a northerly aspect[1]. Grows well in light woodland[200] or in a shady position in a rock garden. The plant is hardy to about -10°C[187]. The leaves and the flowers, however, are liable to be damaged by autumn frosts[200]. A very ornamental plant[1], it is sometimes grown as a house plant[200]. A polymorphic species[1], it is closely related to S. cortusifolia, differing in having runners[200]. Special Features:Attractive foliage, Not North American native, Naturalizing, Inconspicuous flowers or blooms. The plant is heat tolerant in zones 9 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-11 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping mat former. Forming a dense prostrate carpet spreading indefinitely [1-2].

## 7.2.199 Vitis davidii

Spiny Vitis  
6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc  
hmimhtut cyutli kyuctucp hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitis davidii is a deciduous Climber growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[1, 61]. A harsh flavour[22, 183]. A pleasant flavour according to other reports[11, 200]. Small but sweet[182]. The fruit is about 16mm in diameter[200]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour[55]. Young tendrils - raw or cooked[55, 85].

tcanta DyeA yellow dye is obtained from the fresh or dried leaves[168]. Plants can be used as a ground cover in a sunny position[188]. They are best spaced about 3.5 metres apart each way[208]. They can be encouraged to cover the ground by laying brushwood flat on the ground and pegged into position. The twigs would eventually rot and the plant would assume complete and constant control[208].

dwatta None known  
propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182]. They grow particularly well into elm trees[18]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants are occasionally cultivated for their edible fruits[46, 61]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.200 Jasminum officinale

Jessamine, Poet's jasmine  
6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Jasminum officinale is a deciduous Climber growing to 10 m (32ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Condition TeaFlowers - fragrant. Eaten or used to flavour or scent tea[183]. The dried flowers are a tea substitute[177]. An essential oil from the flowers is used as a condiment in various foods, especially Maraschino cherries but also baked goods, ice cream, sweets, chewing gum etc[183, 238]. It imparts a bitter-sweet floral tone[183].

tcanta Essential ParasiticideAn essential oil from the flowers is used in perfumery[46, 171, 200]. The flowers are picked soon after opening each morning and used fresh for oil extraction[238].

dwatta Antiseptic Antispasmodic Aphrodisiac Aromatherapy Galactogogue Parasiticide TonicThe leaf juice is applied to corns and ear discharges[218, 240]. The leaves contain salicylic acid (found also in the bark of Salix species and used as an analgesic, febrifuge etc)[218, 240]. The root is used in the treatment of ringworm[240]. The flowers are aphrodisiac, antiseptic, antispasmodic, galactogogue and tonic[178, 218, 238]. They are mainly used in aromatherapy (see below). The essential oil is used in aromatherapy. Its keyword is 'Aphrodisiac'[210]. It is used in the treatment of depression, nervous tension, impotence, frigidity, menstrual disorders and weak digestion[238].

propta Seed - best sown as soon as it is ripe in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy. Cuttings of mature wood in November. Layering.

nwatta Succeeds in a good well-drained loam[200], preferring a sunny position[182]. Very shade tolerant, it succeeds on a north facing wall[200]. Plants are hardy to about -15°C[184]. They require the protection of a wall in northern Britain but are fully hardy in the south[11]. Another report

given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet cold and shallow soils but is not very wind-firm in shallow soils[1]. Resists wind exposure to some degree[200]. A shallow-rooted tree, in the wild it is often blown down by strong winds[229]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. This species has been planted experimentally as a timber crop in N. Europe[50]. It is slow to get started, but can then grow fairly rapidly when established though it soon slows down and seems to be fairly short-lived in cultivation, around 100 years is probably the limit[185]. Wild trees live about 300 - 400 years[229]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Seed production commences when the tree is about 15 years old, though reliable crops are not produced for another 5 - 10 years[229]. Heavy crops occur every 4 - 6 years[229]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Closely related to and hybridizes in the wild with *P. mariana*[229]. It is believed by some botanists to be a hybrid between *P. mariana* and *P. glauca*[226]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. The crushed leaves are redolent of apples or camphor[185]. Special Features: North American native, Inconspicuous flowers or blooms.

## 7.2.196 Ampelopsis arborea

Pepper Vine

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli jlut hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Ampelopsis arborea is an evergreen Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A poor taste[177]. The fruit is about 8mm in diameter and contains 3 seeds[200, 235]. It is carried in small bunches on the plant, rather like grapes[K]. The flesh is thin and inedible[235].

tcanta None known  
dwatta None known

propta Seed - sow in pots in a cold frame in the autumn or stratify for 6 weeks at 5°C and sow in the spring[200]. Germination can be quite slow, sometimes taking more than a year. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. When they are more than 20cm tall, they can be planted out into their permanent positions, preferably in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long, July/August in a frame[78]. Cuttings or eyes in late autumn or winter. Either place them in the ground in a greenhouse or cold frame, or put them in pots. An eye cutting is where you have just one bud at the top and a short length of stem with a small part of the bark removed. These normally root well and grow away vigorously, being ready to plant into their permanent positions the following autumn. Layering into pots in late summer. Partially sever the stem in spring and then lift the new plants in the autumn[78].

nwatta Prefers a deep rich loam in a warm sheltered position in sun or semi-shade[200]. A very ornamental plant[1], when dormant it is quite hardy in Britain, but is better grown on a wall[11]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. It rarely flowers or fruits in this country except after a long hot summer[11, 182, 200]. Plants are deciduous in cold winters[219]. Plants climb by means of coiling tendrils but large plants often need tying in to support the weight of

foliage[200]. Any pruning is best carried out in the winter[219].

## 7.2.197 Amaranthus blitoides

Mat Amaranth

6 tlin 10 cyuc 2 kcaak 1 tcan 0 dwat 0.2 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwis hpa7tmwatli fyif hjonli

drutta Amaranthus blitoides is a ANNUAL growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 6 and is frost tender. It is in leaf from April to October, in flower from August to September, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SeedEdible Uses: Leaves - raw or cooked[46, 61, 95, 105]. Rich in vitamins and minerals, it is used as a spinach[206, K]. The leaves can be dried and used as a winter food[257]. Seed - raw or cooked[46, 61, 95, 105, 257]. Very small and fiddly, about 1.5mm in diameter[266], but the seed is very nutritious. Rich in starch[177]. The seed can be ground into a powder and used in making porridge, bread, mush, as a flavouring in soups etc[257]. The seed can be cooked whole, and becomes very gelatinous like this, but it is rather difficult to crush all of the small seeds in the mouth and thus some of the seed will pass right through the digestive system without being assimilated[K].

tcanta Adhesive DyeYellow and green dyes can be obtained from the whole plant[168]. A glue is made from the plant[257]. No more information is given, it is likely that the starch from the seed was used[K].

dwatta None known

propta Seed - sow late spring in situ. An earlier sowing can be made in a greenhouse and the plants put out after the last expected frosts. Germination is usually rapid and good if the soil is warm[133]. A drop in temperature overnight aids germination[133]. Cuttings of growing plants root easily[206].

nwatta Prefers a well-drained fertile soil in a sunny position[200]. Requires a hot sheltered position if it is to do well[K]. Plants should not be given inorganic fertilizers, see notes above on toxicity. There is some confusion over the correct name for this species, some authorities say that it is part of *A. graecizans*[58, 60], whilst others say that it is a distinct species[50]. Most if not all members of this genus photosynthesize by a more efficient method than most plants. Called the 'C4 carbon-fixation pathway', this process is particularly efficient at high temperatures, in bright sunlight and under dry conditions[196].

## 7.2.198 Saxifraga stolonifera

Strawberry Saxifrage, Creeping Saxifrage, Strawberry Geranium, Strawberry Begonia

6 tlin 10 cyuc 2 kcaak 2 tcan 2 dwat 0.2 m hkuc hmim cyutli tcup hwicli hyishrasljutnyikrip hpa7tli flatprikwis hpa7tmwatli hjonli

drutta Saxifraga stolonifera is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves StemEdible Uses: Leaves - raw or cooked[105, 177]. Relished in Japan when boiled or fried and used in salads[183]. Flowering stem - said to be tasty when salted[183].

tcanta Can be grown as a ground cover plant in a shady position[188]. Plants should be spaced about 45cm apart each way[208].

be stored in a cool place, such as the salad compartment of a fridge, for a few months if it is kept moist, but check regularly for signs of germination. The seed should germinate in late winter or early spring. If sown in an outdoor seedbed, the plants can be left in situ for 1 - 2 years before planting them out in their permanent positions. If grown in pots, the plants can be put out into their permanent positions in the summer or autumn, making sure to give them some protection from the cold in their first winter[K]. Division of suckers in winter[200]. They can be planted straight out into their permanent positions.

nwatta Prefers a good well-drained slightly acid loam but succeeds in dry soils[1, 11, 200]. Once established, it is very drought tolerant[1, 11, 200]. Very tolerant of highly acid, infertile dry sands[200]. Averse to calcareous soils but succeeds on harder limestones[11, 200]. This species only rarely thrives in areas with hot summers[200], it may not be hardy in Britain[11]. Another report says that it succeeds in climatic zone 7 and should therefore tolerate temperatures down to at least -10°C[200]. Usually a small shrub[11], this species occasionally reaches small-tree size (as *C. alnifolia* floridana. Sarg.][82] This species is similar to and often confused with *C. pumila*[1, 11]. An excellent soil-enriching understorey shrub in pine forests[200]. It grows into a clump by means of suckers[183, 200]. Flowers are produced on wood of the current year's growth[229]. Plants are fairly self-sterile[200]. They hybridize freely with other members of this genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.145 Viola cornuta

Horned Violet, Bedding Pansy, Tufted Pansy,

6 tlin 11 cyuc 3 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Viola cornuta is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Flowers LeavesEdible Uses: TeaY-oung leaves and flower buds - raw or cooked[172]. When added to soup they thicken it in much the same way as okra[85, 159]. Flowers - raw[172]. A tea can be made from the leaves[85].

tcanta A useful ground cover plant for a cool open situation[197]. It needs weeding for the first year or two[197] but then forms an effective weed-excluding cover[233]. Plants are best spaced about 60cm apart each way[208].

dwatta None known

propta Seed - best sown in the autumn in a cold frame. Sow stored seed in early spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in the autumn or just after flowering. Larger divisions can be planted out direct into their permanent positions, though we have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Landscape Uses:Border, Container, Rock garden, Woodland garden. Easily grown in any fertile soil in full sun or partial shade[233]. Prefers a well-drained moisture-retentive soil[188]. Tolerates sandstone and limestone soils but becomes chlorotic if the pH is too high. Prefers a pH between 6 and 6.5[200]. A very ornamental plant, there are many named forms[200]. If the plants are cut back after flowering they will flower again in late summer[208]. All members of this genus have more or less edible leaves and flower buds, though those species with yellow flowers can cause diarrhoea if eaten in large quantities[62, 85, 159]. This species has deep-violet flowers[233]. Special Features: Naturalizing, Suitable for cut flowers.

## 7.2.146 Pinus lambertiana

Sugar Pine

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 75 m hkuc htut cyutli hgatkuyctup hwicli hyishrasljut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta Pinus lambertiana is an evergreen Tree growing to 75 m (246ft 1in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcaakta Edible Parts: SeedEdible Uses: Condi-ment Gum SweetenerSeed - raw or cooked[1, 2, 62, 63, 92, 257]. A good size, up to 15mm x 10mm[200]. A pleasant sweet nutty flavour[11, 183], with a hint of resin[2]. The nut, together with the shell, can be pulverised into a nut butter[84]. A sugar is obtained from boiling off the water in the sap[1, 2, 63, 92, 94]. Some caution is advised since it is laxative if used in large quantities[95]. A sweet sugar-like substance exudes from wounds made in the heartwood of the tree[81, 82, 183] and also from the cones. It is sometimes used for sweetening foods, though in large quantities it is laxative[2, 183]. The pitch obtained from the trunk is allowed to harden and is then used as a chewing gum[257]. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Adhesive Dye Gum Herbicide Pitch WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Yields a pitch, though it is not commercially important[64]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc. for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. The resin is used as an adhesive[257]. Wood - light, soft, straight but coarse grained. Used for lumber; interior finishes etc[46, 82, 84, 171, 229].

dwatta Carminative Laxative Ophthalmic PoulitceThe turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4]. The sap is carminative and laxative[257]. The dried sap powder has been eaten in the treatment of stomach gas, constipation, ulcers etc[46, 61, 84, 92, 94]. It has also been used to make eye drops to treat sore eyes[257].

propta It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long

as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

nwatta Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Plants have a deep taproot that anchors them firmly when growing in a windy site[229]. A very vigorous tree in Britain, capable of growing 1 metre per year when young[185]. The trees are long-lived in their native environment, but can take 100 years or more before they come into reliable seed bearing[229]. Even then seed production is sparse, with good yields only every 4 - 5 years[229]. The cones open and shed their seed in early autumn whilst still attached to the tree[82, 226]. They are up to 45cm long and often drip with a sweet sap[81]. Unfortunately the cones are seldom borne in Britain[11], though a tree at Hawkestone Park in Shropshire often bears cones[11]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow beneath the tree[18]. Trees are susceptible to the 'black pine blister rust' and should not be grown near to blackcurrants[120, 200]. This rust killed off all the plantings of this species that were made prior to 1960[185]. Plants in this genus are notably susceptible to honey fungus[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The crushed leaves and shoots have a sweet grapefruit-like aroma[185].

## 7.2.147 Capsella bursa

Shepherd's Purse  
6 tin 10 cyuc 3 kcaak 3 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli frusflat-prikwishsom hpa7tmwatli fyfixre7t hjonli

drutta Capsella bursa-pastoris is a ANNUAL growing to 0.3 m (1ft) by 0.1 m (0ft 4in). See above for USDA hardness. It is hardy to UK zone 6 and is not frost tender. It is in flower all year, and the seeds ripen all year. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Leaves Oil SeedEdible Uses: Condiment OilLeaves - raw or cooked[2, 4, 5, 52, 94]. The young leaves, used before the plant comes into flower, make a fine addition to salads[9]. The leaves are a cress and cabbage substitute[12], becoming peppery with age[172]. Leaves are usually available all year round, though they can also be dried for later use[12]. The leaves contain about 2.9% protein, 0.2% fat, 3.4% carbohydrate, 1% ash. They are rich in iron, calcium and vitamin C[179]. A zero moisture basis analysis is available[218]. The young flowering shoots can be eaten raw or cooked[264]. They are rather thin and fiddly but the taste is quite acceptable. They can be available at most times of the year. Seed - raw or cooked[94, 172]. It can be ground into a meal and used in soups etc[102, 183]. It is very fiddly to harvest and utilize, the seed is very small[85]. The seed contains 35% of a fatty oil[179]. This oil can be extracted and is edible[74]. The seedpods can be used as a peppery seasoning for soups and stews[183]. The fresh or dried root is a ginger substitute[85, 172, 183].

tcanta Insecticide Oil Soil reclamationThe seed, when placed in water, attracts mosquitoes. It has a gummy substance that binds the insects mouth to the seed[201]. The seed also releases a substance toxic to the larvae. ½ kilo of seed is said to be able to kill 10 million larvae[172]. Plants can be grown on salty or marshy land in order to reclaim it by absorbing the salt and 'sweetening' the soil[201]. Birds are very fond of the seeds of shepherd's purse[201]. Dynamic accumulator.

dwatta Antiscorbutic Astringent Cancer Diuretic Emmenagogue Haemostatic Homeopathy Hypotensive Oxytoxic Stimulant Urinary Vasoconstrictor Vasodilator Vitamin C VulneraryShepherd's purse is little used in herbalism, though it is a commonly used domestic remedy, being especially efficacious in the treatment of both internal and external bleeding, diarrhoea etc[4, 222]. A tea made from the whole plant is antiscorbutic, astringent, diuretic, emmenagogue, haemostatic, hypotensive, oxytoxic, stimulant, vasoconstrictor, vasodilator and vulnerary[4, 7, 9, 13, 21, 46, 147, 165, 172, 176, 222]. A tea made from the dried herb is considered to be a sovereign remedy against haemorrhages of all kinds - the stomach, the lungs, the uterus and more especially the kidneys[4, 222]. The plant can be used fresh or dried, for drying it is harvested in the summer[9]. The dried herb quickly loses its effectiveness and should not be stored for more than a year[9]. Clinical trials on the effectiveness of this plant as a wound herb have been inconclusive[244]. It appears that either it varies considerably in its effectiveness from batch to batch, or perhaps a white fungus that is often found on the plant contains the medically active properties[244]. The plant has been ranked 7th amongst 250 potential anti-fertility plants in China[218]. It has proven uterine-contracting properties and is traditionally used during childbirth[222]. The plant is a folk remedy for cancer - it contains fumaric acid which has markedly reduced growth and viability of Ehrlich tumour in mice[218]. A homeopathic remedy is made from the fresh plant[4]. It is used in the treatment of nose bleeds and urinary calculus[7]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve Capsella bursa-pastoris Shepherd's Purse for nose bleeds, premenstrual syndrome, wounds and burns (see [302] for critics of commission E).

propta Seed - sow in situ February to May. Seed can also be sown as late as mid autumn[206]. A common weed of disturbed ground, the plant does not normally need any help to maintain itself[K].

nwatta Plants flourish in most soils[17]. They will grow even in the poorest of soils, though in such a situation the plants might only reach a few centimetres tall before they flower and set seed[4]. In rich soils plants will take longer to go to seed and will grow up to 60cm tall[4]. Shepherd's purse is a very common garden weed that can spread freely in cultivated ground. It is usually in flower and producing seed in all months of the year. This species is a prime example of how a plant can be viewed as an annoying weed in some areas of the world whilst in others it is actually cultivated for its wide range of uses[4, 183]. The plant is extensively cultivated in some areas of the world as a cabbage-flavoured spring greens[268], in Japan it is one of the essential ingredients of a ceremonial rice and barley gruel that is eaten on January 7th[183]. The leaves grow rather larger under cultivation, they can be harvested about a month after sowing and can be treated as a cut and come again crop[206]. They do run to seed fairly rapidly, however, especially in hot dry weather or when in poor soils[206, K]. A member of the cabbage family, it is a host plant for many diseases of Brassicaceae[200].

## 7.2.148 Vitis berlandieri

Spanish Grape  
6 tin 9 cyuc 3 kcaak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flat-prikwish hpa7tmwatli xre7t hjonli

drutta Vitis berlandieri is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or dried for winter use[161, 177]. A rich pleasant flavour[2, 183]. The fruit is rather small, but it is borne in very large clusters[2]. It has a slightly bitter flavour, but is pleasant when fully ripe[200]. Young leaves are wrapped

berries are pounded to a pulp and used in the form of a tincture for the relief of paralysis, pains in the limbs, weakness etc[4]. The root is expectorant, febrifuge and tonic[240]. It is used in the treatment of colds and rheumatic ailments[218]. It is harvested in late summer and autumn, and dried for later use[238]. The plant is said to be a malarial preventative and is also used in the treatment of bacterial dysentery - extracts of the leaves have shown bactericidal and antitumor activity[218].

propta Seed - sow March in a greenhouse. It does not need any pre-treatment[113]. Germination is usually free and quick. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in early summer of the following year. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame. Good percentage[78]. Cuttings of mature wood of the current seasons growth, November in a cold frame[113].

nwatta Landscape Uses:Border, Container, Pollard, Standard, Specimen. An easily grown plant, it prefers a light well-drained loamy soil in a warm sunny position sheltered from cold drying winds[1, 200]. Succeeds in poor dry soils[238]. Plants tolerate temperatures down to about -10°C[200]. They are not very hardy in Britain, they succeeded outdoors at Kew[K], but in general are best given the protection of a sunny wall outside the milder areas of the country[11]. Plants only flower freely after a warm summer, so they are best grown against a sunny wall even in areas where they are hardy[219]. The flowers are produced so late in the season that they are unlikely to produce viable seed in this country even if they flower properly[K]. The plants require abundant summer sunshine in order to ripen their wood fully, the well-ripened wood is more frost resistant[11, 166]. There are some named forms, selected for their ornamental value[219]. The leaves and stems are strongly aromatic[182]. The flowers have a most pronounced musk-like perfume[245]. Special Features: Not North American native, Fragrant flowers, Attractive flowers or blooms.

## 7.2.194 Dryopteris carthusiana

Narrow Buckler Fern, Spinulose woodfern  
6 tin 8 cyuc 2 kcaak 0 tcan 4 dwat 1 m hkuc  
hmim cyutli tcup hwiicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta Dryopteris carthusiana is a FERN growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 5. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Root-baked[61]. Some caution is advised, see notes above on toxicity. Old leafstalks on the underground stems can be roasted, peeled and the inner portion eaten[257]. Young curled fronds, harvested as they are developing in the spring, can be boiled and eaten like asparagus[257].

tcanta When spaced about 30cm apart each way, the plants can be grown as a ground cover[208].

dwatta VermifugeThe root contains 'filicin', a substance that paralyses tapeworms and other internal parasites and has been used as a worm expellent[4, 222, 238]. It is one of the most effective treatments known for tapeworms - its use should be immediately followed by a non-oily purgative such as magnesium sulphate in order to expel the worms from the body[238]. An oily purge, such as castor oil, increases the absorption of the fern root and can be dangerous[238]. The root is harvested in the autumn and can be dried for later use, it should not be stored for longer than 12 months[238]. This remedy should be used with caution and only under the supervision of a qualified practitioner[238]. The root is toxic and the dosage is critical[238]. See also the notes above on toxicity.

propta Spores - can be sown at any time of the year in a greenhouse. Surface sow on a sterilised compost and keep moist, possibly by placing the pot in a plastic bag. Germinates in 1 - 3 months at 20°C. Put up small clumps of the plants when they are large enough to handle and grow on in a shady part of the greenhouse until large enough to plant out. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot

up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Landscape Uses:Foundation, Ground cover, Massing, Woodland garden. Prefers an acid to neutral soil, succeeding in ordinary fertile soil in a shady position[175, 200]. Requires permanently moist conditions at its roots. A very ornamental plant[1], it is often evergreen in mild winters[188]. Plants spread slowly at the rootstock[233]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features:Attractive foliage, Not North American native, Naturalizing, There are no flowers or blooms.

## 7.2.195 Picea rubens

Red Spruce  
6 tin 7 cyuc 2 kcaak 0 tcan 1 dwat 30 m hkuc  
hpa7tli cyutli tcup hwiicli hyishrasjlutnyik hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Picea rubens is an evergreen Tree growing to 30 m (98ft 5in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 3. It is in leaf all year, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcaakta Edible Parts: Flowers Inner bark Leaves SeedE Uses: Gum TeaYoung shoots. An emergency food, used when all else fails[177]. Young male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are 3 - 5cm in diameter[82]. Inner bark - dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. An emergency food, it is only used when all else fails. Seed - raw[172]. The seed is about 2 - 4mm long[229] and is too small and fiddly to be worthwhile unless you are desperate[172]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172, 257]. A gum is exuded from the tree as a result of injury to the sapwood. It is used for chewing[46, 61, 171].

tcanta Basketry Fibre Gum Pitch WoodThe bark has been used to make baskets[257]. Pitch can be obtained from the trunk[257]. The roots have been used to make thread for sewing baskets, canoe skins etc[257]. Wood - straight-grained, soft, light, not strong[46, 61, 171, 229]. It weighs 28lb per cubic foot[235]. Used for boxes, sash frames etc. It is also valued for its use in the pulp industry to make paper[46, 61, 171, 229] and is commonly used to produce stringed musical instruments[229].

dwatta Pectoral Poultice Vitamin CA tea made from the boughs has been used in the treatment of colds and to 'break out' measles[222, 257]. The pitch from the trunk has been used as a poultice on rheumatic joints, the chest and the stomach in order to relieve congestion and pain[222]. A decoction of the bark has been used in the treatment of lung complaints and throat problems[257].

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slowing but sure.

nwatta Landscape Uses:Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be

dwatta Anthelmintic Aromatic Astringent Febrifuge Laxative PurgativeThe fruit is aromatic, cooling and laxative[240]. Its use allays thirst and it is of help in the treatment of fevers[240]. The bark is anthelmintic and purgative[240]. A paste of the bark is used in the treatment of gingivitis[272]. A decoction of the leaves is used as a gargle in inflammation of the vocal chords[240]. The root is anthelmintic and astringent[240]. A decoction of the root is used in the treatment of internal parasitid[272].

propta The seed germinates best if given 2 - 3 months cold stratification[80, 98]. Sow the seed as soon as it is ripe if possible, otherwise in February in a cold frame. The seed usually germinates in the first spring, though it sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the cold frame for their first winter. Plant them out in late spring or early summer after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame. Plant out in spring. A good percentage take, though they sometimes fail to thrive[78, 113]. Cuttings of mature wood of the current season's growth, 25 - 30cm with a heel of 2 year old wood, autumn or early spring in a cold frame or a shady bed outside[78, 113, 200]. Bury the cuttings to threequarters of their depth. Layering in autumn[200].

nwatta Prefers a warm well-drained loamy soil in a sunny position[1, 11]. Mulberries have brittle roots and so need to be handled with care when planting them out[238]. Any pruning should only be carried out in the winter when the plant is fully dormant because mulberries bleed badly when cut[238]. Ideally prune only badly placed branches and dead wood[238]. This species is closely related to *M. indica*, and is seen as conspecific by some botanists[266]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Inconspicuous flowers or blooms.

### 7.2.191 Torreya fargesii

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikliwis hpa7tmwatli nyanhjen hjonli

drutta Torreya fargesii is an evergreen Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Oil Oil SeedEdible Uses: Oil OilSeed[81]. No further details are given, but it is likely to be oily and to be eaten raw or cooked. An oil is obtained from the seed[105, 177].

tcanta Oil Oil WoodAn oil is extracted from the seed[266]. The high quality timber is used in constructing houses, bridges, and furniture, and making implements and utensils[266].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame. Some of the seed should germinate in the following spring though much of it might take another 12 months. Stored seed requires a period of cold stratification and can take 18 months or more to germinate. Prick out the seedlings into individual pots as soon as growth is observed and grow them on in light shade in the greenhouse for at least the next couple of winters, making sure to pot them on into larger pots as and when required. Plant them out into their permanent positions in early summer when the plants are at least 20cm tall. Cuttings of half-ripe shoots in late summer[1]. Cuttings do not grow well[11]. Layering.

nwatta Succeeds in ordinary garden soil, tolerating some lime[1]. Requires a sheltered position and either high humidity or a moist riverside soil[200]. Dislikes wind exposure[200]. Tolerates woodland shade very well[200]. Requires hot, very humid summers for best growth[200]. This

species is considered to be suitable for afforestation and reforestation in China[266]. Trees are hardy only in the milder areas of Britain[81]. The seed takes two summers to mature[229]. Plants are dioecious, but sometimes monoecious plants are seen bearing dioecious branches. Male and female plants must be grown if seed and fruit is required.

### 7.2.192 Fibigia clypeata

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc htut cyutli hgatkuyctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Fibigia clypeata is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - raw[177]. Used as a cress in salads[2, 183].

tcanta None known

dwatta None known

propta Seed - sow early spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring. If you have sufficient seed then it is worth making an outdoor sowing in situ in the middle of spring.

nwatta Prefers a hot dry well-drained soil in a sunny position[1, 200].

### 7.2.193 Vitex negundo

Huang Ping, Chinese chastetree, Cut Leaf Vitex, Cut-leaf Chastetree

6 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 3 m hkuc htut cyutli kyucctup hwicli hyishrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Vitex negundo is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: SeedEdible Uses: Condiment TeaSeed - occasionally used as a condiment[177, 183], it is a pepper substitute. When washed to remove the bitterness it can be ground into a powder and used as a flour[179], though it is very much a famine food used only when all else fails[177]. A tea is made from the roots and leaves[177, 183].

tcanta Basketry Hedge Hedge Insecticide Repellent Soil stabilizationYoung stems are used in basket making and for making wattles[51, 146, 158, 272]. The leaves are used to repel insects in grain stores[51, 146]. Extracts of the leaves have insecticidal activity[218]. The fresh leaves are burnt with grass as a fumigant against mosquitoes[238]. The plant is grown on slopes to counter land slides[272].

dwatta Antibacterial Antitumor Astringent Dysentery Expectorant Febrifuge Malaria Sedative Tonic VermifugeThis species is widely used in Chinese herbal medicine, it is the second most important treatment for chronic bronchitis[218]. (The sub-species *V. negundo cannabifolia* (Sieb. and Zucc.)Hand-Mazz. is used.) The leaves are astringent, febrifuge, sedative, tonic and vermifuge[146, 147, 178, 218, 240]. They are useful in dispersing swellings of the joints from acute rheumatism, and of the testes from suppressed gonorrhoea[240]. The juice of the leaves is used for removing foetid discharges and worms from ulcers, whilst an oil prepared with the leaf juice is applied to sinuses and scrofulous sores[240].They are harvested in early summer and used fresh or dried[238]. A decoction of the stems is used in the treatment of burns and scalds[218]. The dried fruit is vermifuge[240]. The fruit is also used in the treatment of angina, colds, coughs, rheumatic difficulties etc[218]. The fresh

around other foods and then baked, they impart a pleasant flavour: Young tendrils - raw or cooked.

tcanta Dye RootstockUsed as a rootstock[183]. A yellow dye is obtained from the fresh or dried leaves[168].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. This species is used in breeding programmes for improved grape cultivars[183]. It produces very large clusters of remarkably small fruits[2]. Plants in this genus are notably susceptible to honey fungus[200].

### 7.2.149 Mahonia x media

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Mahonia x media is an evergreen Shrub growing to 2 m (6ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from February to April, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. An acid flavour but the fruit is rather nice raw, especially when added to muesli or porridge[K]. Unfortunately, there is relatively little flesh and a lot of seeds[K]. The fruit ripens in early spring and good crops have often been seen on plants growing in sheltered positions[K]. The fruit is produced in large clusters and so is easy to harvest[K].

tcanta None known

dwatta Antibacterial Antitumor Dysentery TonicBerberine, universally present in rhizomes of Mahonia species, has marked antibacterial effects[218] and is used as a bitter tonic[213]. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licuorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218]. The root and root bark are best harvested in the autumn[213].

propta Seed - this is a hybrid species and seed will not come true, though some interesting plants might be produced. The seed is best sown as soon as it is ripe in a cold frame[78]. It usually germinates in the spring[K]. ‘Green’ seed (harvested when the embryo has fully developed but before the seed case has dried) should be sown as soon as it is harvested and germinates within 6 weeks[K]. Stored seed should be sown as soon as possible in late winter or spring. 3 weeks cold stratification will improve its germination, which should take place in 3 - 6 months at 10°C. Prick out the seedlings when they are large enough to handle and grow them on in a cold frame for at least their first winter. Plant

them out in late spring or early summer. Division of suckers in spring[78]. Whilst they can be placed direct into their permanent positions, better results are achieved if they are potted up and placed in a frame until established[11]. Leaf cuttings in the autumn. Stems will often root if they are stuck in the ground with most of their leaves removed[182].

nwatta An easily grown shrub, it thrives in any good garden soil including heavy clays. Prefers a semi-shaded woodland position in a damp, slightly acid to neutral humus-rich soil. Survives under very heavy tree shade. The fully dormant plant is hardy to about -15°C[184], though the young growth in spring can be damaged by late frosts. Commonly grown as an ornamental plant, there are several named varieties[182]. This plant often produces a good crop of fruit in April and May. It seems that a sheltered position helps to ensure a good crop, as does growing more than one cultivar together and perhaps also one or both of the parents (*M. bealei* and *M. japonica*)[K]. The cultivars ‘Charity’ and ‘Lionel Fortescue’ have both been seen on a number of occasions with heavy crops[K]. The flowers are very sweetly scented[182].

#### 7.2.150 Allium bolanderi

Bolander's Onion

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Allium bolanderi is a BULB growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[105, 161, 177, 257]. The bulb is 10 - 25mm wide[200]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deep[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.151 Quercus hispanica

6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 20 m hkuc hmimhtut cyutli tcup hwicli jlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Quercus hispanica is a deciduous Tree growing to 20 m (65ft) by 13 m (42ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind.

Suitable for: medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Seed**Edible Uses:** Seed - cooked. Up to 2.5cm long. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

**tcanta Cork Repellent Tannin Wood**The bark is a source of cork, it can be used for heat and sound insulation, flooring, floats etc. The bark is harvested every 6 - 12 years, being carefully removed so as not to harm the tree. A mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood -

**dwatta Astringent Dysentery**Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

**propta Seed** - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly. This is a cultivar and it will not breed true from seed.

**nwatta** Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Grows fairly well in Britain, because of its hybrid parentage between the cork oak and the Turkey oak this tree is potentially a good source of cork for Britain. There are a number of named forms. 'Diversifolia' has a bark that is more corky than the type[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.152 Crambe orientalis

6 tlin 9 cyuc 3 kcaok 0 tcan 0 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli prik-lwis hpa7tmwatli xre7t hjonli

**drutta Crambe orientalis** is a PERENNIAL growing to 1.2 m (4ft) by 1.2 m (4ft) in. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Leaves Root Stem**Edible Uses:** CondimentLeaves - cooked. Immature flowering stems - raw or cooked and used like broccoli[2, 74, 105, 183]. Root - cooked. It is very thick and can be used as a horseradish substitute[2, 105, 183].

**tcanta** None known  
**dwatta** None known

**propta Seed** - sow March/April in a seedbed outdoors and either thin the plants out or move them to their permanent positions when about 10cm tall[111]. The young plants are very attractive to slugs so some protection will often be needed. Germination can be slow so it is best to sow the seed in pots in a cold frame[164]. Germination usually takes place in 3 - 26 weeks at 15°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are at least 10cm tall. Division in spring or autumn[1, 111]. Dig up the root clump and cut off as many sections as you require, making sure they all have at least one growing point. The larger of these divisions can be planted out straight into their permanent positions, though small ones are best potted up and grown on in a cold frame until they are established. Root cuttings, 3 - 10 cm long, in spring[104]. These can be planted straight into the open ground or you can pot them up in the greenhouse and plant them out once they are growing strongly.

**nwatta** An easily grown species, succeeding in a good loam and an open sunny position[1]. Prefers a slightly alkaline soil in a position sheltered from strong winds[200]. Tolerates poor soil and some shade[200]. Dislikes acid soils[1]. Prefers a rather dry soil[187]. Plants are hardy to about -20°c[187]. A deep-rooted plant[233], it dislikes root disturbance[164].

## 7.2.153 Sorbus devoniensis

Devon Whitebeam

6 tlin 9 cyuc 3 kcaok 2 tcan 0 dwat 13 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyixre7t hjonli

**drutta Sorbus devoniensis** is a deciduous Tree growing to 13 m (42ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, Apomictic (reproduce by seeds formed without sexual fusion). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked. The fruit is usually blotted if it is going to be eaten raw[3, 5, 11]. This involves storing the fruit in a cool dry place until it is almost but not quite going rotten. At this stage the fruit has a delicious taste, somewhat like a luscious tropical fruit[K]. The fruit is up to 15mm across[200] and is produced in bunches which makes harvesting easier[K].

**tcanta** Attracts wildlife.

**dwatta** None known

**propta Seed** - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

**nwatta** Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. At one time the fruits of this species were collected and sold in local markets in S.W. England[11, 183]. Plants are susceptible to fireblight[188]. It is part of the aggregate species *S. latifolia*, it breeds true because its seed is produced apomictically[17]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw or cooked[177]. The fruit is about 3cm in diameter[200].

**tcanta** None known

**dwatta** None known

**propta Seed** - best sown in a cold frame as soon as it is ripe in the autumn, it will then usually germinate in mid to late winter. Stored seed requires 8 - 10 weeks cold stratification at 1°c and should be sown as early in the year as possible[200]. Temperatures over 15 - 20°c induce a secondary dormancy in the seed[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for their first year. Plant them out in late spring or early summer of the following year.

**nwatta** Prefers a good well-drained loam in full sun[200]. Grows well in heavy clay soils. Tolerates light shade but does not fruit so well in such a position. Tolerates atmospheric pollution, excessive moisture and a range of soil types if they are moderately fertile[200]. Established plants are drought tolerant[200]. Plants are hardy to about -15°c[200]. This species is closely related to *P. amygdaliformis*[11].

## 7.2.188 Cardamine lyrata

6 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyixre7t hjonli

**drutta Cardamine lyrata** is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June, and the seeds ripen from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

**kcakta Edible Parts:** Leaves Root**Edible Uses:** Leaves - raw or cooked[105, 177]. Root - raw or cooked[105, 177].

**tcanta** None known

**dwatta** None known

**propta Seed** - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°c[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

**nwatta** Succeeds in most soils[1]. Prefers a moist humus rich soil in shade or semi-shade[200]. A stoloniferous species[200].

## 7.2.189 Ephedra gerardiana

Ma Huang, Gerard jointfir

6 tlin 9 cyuc 2 kcaok 0 tcan 4 dwat 0.6 m hkuc htut cyutli hgtakkyuctup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli nyanhjen hjonli

**drutta Ephedra gerardiana** is an evergreen Shrub growing to 0.6 m (2ft) by 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It

cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw[105, 146]. A sweet flavour[158]. The fruit is about 7mm in diameter[200].

**tcanta Fuel**The wood is very close grained[158]. Too small for commercial exploitation, though it is used locally for fuel[146]. A good ground cover plant for dry soils[188]. Plants should be spaced about 60cm apart each way[208].

**dwatta Antiasthmatic Antirheumatic Cardiotonic Diaphoretic Diuretic** Fibrifuge Tonic Vasodilator VD VulneraryMembers of this genus contain various medicinally active alkaloids (but notably ephedrine) and they are widely used in preparations for the treatment of asthma and catarrh[238]. Ephedrine acts promptly to reduce swellings of the mucous membranes and has antispasmodic properties, thus making it valuable in the treatment of asthma[4]. This species contains between 0.28 and 2.79 alkaloids[240]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. The plant also has antiviral effects, particularly against influenza[238]. The stems are a pungent, bitter, warm herb that dilates the bronchial vessels whilst stimulating the heart and central nervous system[238]. The stems are also diaphoretic, diuretic and vasodilator[4, 61, 165, 238]. They are used internally in the treatment of asthma, hay fever and allergic complaints[238]. They are also combined with a number of other herbs and used in treating a wide range of complaints[238]. This herb should be used with great caution, preferably under the supervision of a qualified practitioner[238]. It should not be prescribed to patients who are taking monoamine oxidase inhibitors, or suffering from high blood pressure, hyperthyroidism or glaucoma[238]. Ephedrine is seen as a performance-boosting herb and, as such, is a forbidden substance in many sporting events such as athletics[K]. The stems are used in Tibetan medicine, where they are considered to have a bitter taste and a cooling potency[241]. Fibrifuge, tonic and vulnerary, they are used in the treatment of severe bleeding and chronic fevers[241]. A decoction of the stems and roots is used in Russia to treat rheumatism and syphilis[243]. The stems can be harvested at any time of the year and are dried for later use[238]. The juice of the berries is used to treat respiratory affections[243].

**propta Seed** - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

**nwatta** Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and are also lime tolerant[200]. Plants are hardy to about -15°c[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.190 Morus australis

Korean Mulberry, Aino Mulberry

6 tlin 9 cyuc 2 kcaok 0 tcan 2 dwat 7.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli fyit hjonli

**drutta Morus australis** is a deciduous Tree growing to 7.5 m (24ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from May to June, and the seeds ripen from July to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit**Edible Uses:** Fruit - raw[3, 272]. Sweet and juicy[183] but insipid[1, 11]. The fruit is about 15mm in diameter[200].

**tcanta Fibre**The bark fibers are used for making paper[266].



mulch in the autumn[238, K]. This species is probably a hybrid between sweet marjoram (*O. majorana*) and Oregano (*O. vulgare*). It resembles *O. majorana* in appearance and aroma, and has the same culinary uses, but is more tolerant of British winters[238]. A good companion plant, improving the flavour of nearby plants[14, 18, 20]. The flowers are very attractive to bees[108]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.185 Quercus acuta

Japanese Evergreen Oak  
6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 25 m hkuc  
hmimhtut cyutli tcup hwicli jltunyk hpa7tli flatprklwis hpa7tmwatli hjonli

drutta *Quercus acuta* is an evergreen Tree growing to 25 m (82ft 0in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[105, 177]. About 2cm long[200]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - quickly loses viability if allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed but must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Screen, Specimen, Street tree. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Unsuitable for chalky soils[1]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A very ornamental tree[1], it grows best in the milder areas of the country[11]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 7.2.186 Saussurea costus

Costus  
6 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Saussurea costus* is a PERENNIAL growing to 3 m (9ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe aromatic root is sometimes used as a spice[183]. It has a characteristic penetrating odour reminiscent of violet, orris and vetiver[183].

tcanta Essential Hair IncenseAn essential oil obtained from the roots is used medicinally, in perfumery, incenses and as a hair rinse when it is said to darken grey hair[61]. It has a strong lingering scent[238]. The smell is at first like violets, but as it ages it can become more fur-like or eventually become unpleasantly goat-like[245]. The roots are cut into lengths about 8cm long and then dried before being exported[211]. Smaller pieces of the root are ground into a powder and then used to make incense sticks[211]. The longer clean pieces are cut into very thin slices and then burnt at shrines or used as a tonic in hot baths[211].

dwatta Anodyne Antibacterial Antispasmodic Aphrodisiac Carminative Emmenagogue Skin Stimulant Tonic VermifugeCostus is a commonly used medicinal herb in China and is considered to be one of their 50 fundamental herbs[218]. It is also used in Ayurvedic medicine where it is valued mainly for its tonic, stimulant and antiseptic properties[254]. It is said to be aphrodisiac and to be able to prevent the hair turning grey[254]. The root is anodyne, antibacterial, antispasmodic, aphrodisiac, carminative, skin, stimulant, stomachic, tonic and vermifuge[61, 147, 176, 218]. It is used internally in the treatment of abdominal distension and pain, chest pains due to liver problems and jaundice, gall bladder pain, constipation associated with energy stagnation, and asthma[238]. The root is harvested in the autumn or spring and either dried for later use or decocted for the essential oil[238]. It is normally used with other herbs[218]. The root is also used in Tibetan medicine where it is considered to have an acrid, sweet and bitter taste with a neutral potency[241]. It is used in the treatment of swelling and fullness of the stomach, blockage and irregular menses, pulmonary disorders, difficulty in swallowing and rotting/wasting of muscle tissues[241]. An oil from the root is very beneficial in the treatment of rheumatism[211].

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in the spring. Surface sow, or only just cover the seed, and make sure that the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring after the last expected frosts. Division in spring might be possible.

nwatta Succeeds in most soils in a sunny well-drained position[1]. Cultivated as a medicinal plant and for its use in perfumery in the Himalayas[51, 245]. The dried root has something of the mossy smell of violets when fresh, becoming fur-like or even unpleasantly goat-like with age[245]. Most of the roots are exported to China and Japan and the plant forms quite a large article of commerce in Kashmir, the trade being controlled by the State[211]. Wild plants have been greatly over-collected and the plant has been placed on the CITES I list of endangered species - it is now illegal to dig them up for export[238].

## 7.2.187 Pyrus persica

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 6 m hkuc  
hmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Pyrus persica* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK

## 7.2.154 Allium carinatum

Keeled Garlic  
6 tlin 9 cyuc 3 kcaak 0 tcan 2 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Allium carinatum* is a BULB growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked[22]. The bulb is very small, about 15mm tall and 10mm in diameter[203, 235]. Leaves - raw or cooked. Flowers - raw. Bulbils - raw or cooked. Rather small and fiddly to use, but they have a fairly pleasant onion/garlic flavour[K].

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. Very easy, the plants divide successfully at any time in the growing season and the divisions can be planted straight out into their permanent positions if required. Bulbils are harvested in late summer and can be planted out immediately in situ or stored and planted out in spring.

nwatta Prefers a sunny position in a light well-drained soil[1]. Succeeds in clay soils[203]. The bulbs should be planted fairly deeply[1]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the other[201]. A good plant for the wild garden[42]. This species can become very invasive by means of its bulbils[203]. The sub-species *A. carinatum pulchellum* Bonnier, and *Layens.* is much better behaved and makes a good garden plant[203]. Closely allied to *A. oleraceum*[1]. Produces new growth in early autumn[K]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.155 Commelina communis

Day Flower, Asiatic dayflower  
6 tlin 9 cyuc 3 kcaak 1 tcan 2 dwat 0.8 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Commelina communis* is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Leaves, flowers and young shoots - raw or cooked[2, 105, 177]. Chopped finely and added to salads or cooked as a potherb[183]. A sweet taste with a mucilaginous texture[179].

tcanta DyeA bright blue dye is obtained from the petals[74].

dwatta Antibacterial Astringent Depurative Diuretic FebrifugeThe leaves are depurative, diuretic and febrifuge[116, 147]. Used as a throat gargle to relieve sore throats and tonsillitis[116, 266]. A decoction of the dried plant is used to treat bleeding, diarrhoea, fever etc[218]. Extracts of the plant show antibacterial activity[218].

propta Seed - sow March in a greenhouse. The seed usually germinates in 4 - 5 weeks at 20°C[164]. When they are large enough to handle, prick the seedlings out into individual pots plant them out in late spring or early summer, after the last expected frosts. Division in early spring. Make sure that each portion has at least one growing bud[111, K]. Cuttings during the growing season. Very easy[200].

nwatta Prefers a light well-drained loam with added leaf-mold[1, 42]. Requires a sheltered position[42]. This species is commonly cultivated as a vegetable in China[2]. The plant can be invasive[42], the stems sprawling along the ground and rooting as they go[K].

## 7.2.156 Aster scaber

6 tlin 9 cyuc 3 kcaak 2 tcan 0 dwat 1.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprklwis hpa7tmwatli fyfxre7t hjonli

drutta *Aster scaber* is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young plant[105, 177]. Frequently used in Korean cuisine and called *chamchi* or *chwinamul*. The leaves are stir-fried or blanched. Used in *namul* - A Korean herbal side dish. Used as a flavoring herb in *kimchi* or rice.

tcanta Attracts wildlife. A good food forest plant for moist soil and sunny conditions.

dwatta None known  
propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 7.2.157 Poncirus trifoliata

Bitter Orange, Hardy orange, Trifoliat Orange, Japanese Hardy Orange

6 tlin 9 cyuc 3 kcaak 3 tcan 2 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjlutnyik hpa7tli frusflatprklwisslip hpa7tmwatli fyfxre7t hjonli

drutta *Poncirus trifoliata* is a deciduous Shrub growing to 3 m (9ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Condi-mentFruit - cooked. A bitter and acrid flavour, but it can be used to make a marmalade[3, 11, 105]. The fruit is also

used to make a refreshing drink[61, 183]. The freshly picked fruit yields little juice but if stored for 2 weeks it will yield about 20% juice[183], which is rich in vitamin C. Yields of up to 14 kilos of fruit per plant have been achieved in America[160]. The fruit is 2 - 3cm wide[188], though most of this is the skin[K]. The fruit peel can be used as a flavouring[183]. Young leaves - cooked[183].

tcanta Hedge Hedge RootstockUsed as a rootstock for Citrus species (oranges, lemons etc)[105, 160]. It confers an extra 3°C resistance to the cold[160]. The plant is very thorny and makes an excellent impenetrable barrier or hedge[3, 11, 29], though this barrier is not very dense[K]. The plants are very tolerant of pruning[182], they are best clipped in early summer shortly after flowering[200, 245].

dwatta Antiemetic Antispasmodic Carminative Deobstruent Digestive Diuretic Expectorant Laxative Odontalgic Stimulant Stomachic Vasoconstrictor Vitamin CThe thorns are used in the treatment of toothache[218]. The stem bark is used in the treatment of colds[218]. The fruits contain a number of medically active constituents including flavonoids, coumarins, monoterpenes and alkaloids[279]. The fruit, with the endocarp and seeds removed, is carminative, deobstruent and expectorant[176]. It is used in the treatment of dyspepsia, constipation and abdominal distension, stuffy sensation in the chest, prolapse of the uterus, rectum and stomach[176]. It is milder in effect than the immature fruit and is better used for removing stagnancy of food and vital energy in the spleen and stomach[176]. The unripe fruit is anti-diarrhetic, antiemetic, antispasmodic, deobstruent, digestive, diuretic, laxative, stimulant, stomachic and vasoconstrictor[147, 176, 178, 218]. It is used in the treatment of dyspepsia, constipation and abdominal distension, stuffy sensation in the chest, prolapse of the uterus, rectum and stomach, shock[176].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Cold stratify stored seed for 4 weeks and sow early spring in a greenhouse[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, June/July in a frame[1].

nwatta Landscape Uses:Border, Espalier, Foundation, Hedge, Screen, Standard, Winter interest. An easily grown plant, it succeeds in an ordinary garden soil[1], preferably well-drained[182], but prefers a fertile light sandy soil in a sunny position[11, 200]. A plant is growing and fruiting well in light woodland shade at Cambridge Botanical Gardens[K]. Plants dislike soil cultivation close to their roots and so should either be well mulched to prevent weed growth, or hand weeded[202]. Succeeds in poor acid soils[229]. Plants also succeed in chalk-laden soils[245]. Hardy to about -15°C[184]. Plants have survived -30°C of frost without injury according to one report[11]. The bitter orange hybridizes with Citrus species and could possibly be used in breeding programmes to produce hardier forms of oranges, lemons etc[61, 160]. It could also be of value in conferring disease resistance, tolerance of poorer soils and dwarfing characteristics. The flowers are produced on the previous years wood[200]. The whole plant, but especially the flowers[202], is strongly aromatic[182]. A very ornamental plant[1, 11], the fruits are freely formed in south-western Britain[11, 59]. A hedge at Wisley in a semi-shaded position fruits heavily in most years[K]. Another report says that warm autumns are required if the plant is to fruit freely. Fertile seed is produced after warm summers[182]. Plants are relatively short-lived, deteriorating after about 25 years[202]. Special Features: Not North American native, Naturalizing, Fragrant flowers, Attractive flowers or blooms.

## 7.2.158 Foeniculum vulgare azoricum

Florence Fennel

6 tlin 9 cyuc 3 kcaak 3 tcan 3 dwat 1.5 m hkuc  
htut cyuti kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatti fyfxfre7t hjonli

drutta Foeniculum vulgare azoricum is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is

self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate strong winds but not maritime exposure.

kckahta Edible Parts: Leaves Root Seed StemEdible Uses: CondimentLeaves - raw or cooked[52]. A delicious aniseed flavour, the young leaves are best since older ones become tough. They make a very nice addition to mixed salads[K]. Leaf stalks and stem base - raw, cooked or used as a flavouring in soups etc[50, 61, 183]. A strong, aniseed flavour[K]. They are often blanched before being eaten[183]. Very low in carbohydrates, proteins and fats[132]. Seeds raw or cooked. They have a delicious aniseed flavour and are used as a flavouring in cakes, bread etc[52, 183]. Root-cooked[53]. The flavour is somewhat parsnip-like[K]. A herb tea can be made from the seeds or the leaves[16, 183].

tcanta Dye Essential Repellent StrewingThe seed yields up to 5% of an essential oil[1, 4, 46]. This is used medicinally, as a food flavouring, in toothpastes, soaps, perfumery, air fresheners etc[1, 46, 238]. The flavour of fennel oil depends upon its two main constituents. 'Fenchone' is a bitter tasting element whilst 'anethole' has a sweet anise-like flavour[238]. The proportions of these two ingredients varies according to strain and region. Plants growing in the Mediterranean and southern Europe usually have a sweet oil whilst plants growing in central and northern Europe usually produce a more bitter oil[238]. The quality of the oil also depends upon how well the seed has been dried - the oil from fully ripened and dried seeds being much sweeter and more fragrant[245]. The dried plant is an insect repellent[14, 53], the crushed leaves are effective for keeping dogs free of fleas[201]. The plant was formerly used as a strewing herb[201]. Yellow and brown dyes are obtained from the flowers and leaves combined[168].

dwatta Analgesic Antinflammatory Antispasmodic Aromatic Carminative Diuretic Emmenagogue Expectorant Galactogogue Hallucinogenic Stimulant Stomachic UrinaryFennel is a commonly used household remedy, being useful in the treatment of a variety of complaints, especially those of the digestive system. The seeds, leaves and roots can be used, but the seeds are most active medicinally and are the part normally used[4]. An essential oil is often extracted from the seed for medicinal use, though it should not be given to pregnant women[4, 238]. The plant is analgesic, anti-inflammatory, antispasmodic, aromatic, carminative, diuretic, emmenagogue, expectorant, galactogogue, hallucinogenic, laxative, stimulant and stomachic[4, 7, 9, 21, 147, 165, 176, 192, 238]. Fennel is often added to purgatives in order to allay their tendency to cause gripe, and also to improve the flavour[4]. An infusion of the root is used to treat urinary disorders[238]. An essential oil obtained from the seed is used in aromatherapy. Its keyword is 'Normalising'[210]. The essential oil is bactericidal, carminative and stimulant[218]. Some caution is advised, see notes above on toxicity[222].

propta Seed - best sown in early spring in situ[1]. Division in March as the new growth appears[16, 200].

nwatta Succeeds in most soils[1] but prefers a sunny dry position[200]. A cultivated form of *F. vulgare*, grown for its edible swollen leaf bases, there are some named varieties[183]. This is the genuine Florence fennel[200]. Attracts bees and hoverflies[24]. Fennel is a poor companion plant in the garden, it inhibits the growth of nearby plants, especially beans, tomatoes and kohlrabi[14, 18]. It is itself inhibited by wormwood and coriander[14, 18].

## 7.2.159 Corylus jacquemontii

Indian Tree Hazel

6 tlin 9 cyuc 3 kcaak 0 tcan 0 dwat 25 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwisslip hpa7tmwatti fyif hjonli

drutta Corylus jacquemontii is a deciduous Tree growing to 25 m (82ft 0in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow

hmimhtut cyuti kyuctcup hwicli hrasljutnyik hpa7tli priklwis hpa7tmwatti fyfxfre7t hjonli

drutta Ophrys apifera is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckahta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. When well-suited, the plants can multiply rapidly[230]. Grows well in a sunny dry border or on a screed[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. This species can often appear in disturbed habitats well away from its normal preferred sites on chalk and limestone hills[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones. This species is unique in the genus, however, in that it is not pollinated by

insects but is self-pollinated[230]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

## 7.2.184 Origanum x majoricum

Hardy Marjoram

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc  
hmimhtut cyuti kyuctcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatti xre7t hjonli

drutta Origanum x majoricum is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kckahta Edible Parts: LeavesEdible Uses: Condiment TeaThe following uses are for *O. majorana*. They almost certainly also apply to this plant. Leaves - raw or cooked[2, 52]. Sweet marjoram is widely used as a flavouring for salad dressings, vegetables, legumes and oils[7, 14, 27, 61, 171, 238]. It has a more delicate flavour than the closely related oregano (*Origanum vulgare*), and is best when used fresh and only added towards the end of cooking[238]. The aromatic seeds are used as a flavouring in sweets, drinks etc[183]. A herb tea is made from the fresh or dried leaves[21, 183]. The flavour resembles a blend of thyme, rosemary and sage[183].

tcanta Disinfectant Dye EssentialThe following uses are for *O. majorana*. They almost certainly also apply to this plant. The leaves and flowers yield 0.3 - 0.4% essential oil by steam distillation[240]. Called 'Oil of Sweet Marjoram', it is used as a food flavouring and in perfumery, soaps, hair products etc[57, 61, 171, 238]. The plant is often used to disinfect bee hives[7].

dwatta Antiseptic Antispasmodic Aromatherapy Carmative Chologogue Diaphoretic Disinfectant Emmenagogue Expectorant Stimulant Stomachic TonicThe following uses are for *O. majorana*. They almost certainly also apply to this plant. The herb is antiseptic, antispasmodic, carminative, chologogue, diaphoretic, diuretic, emmenagogue, expectorant, stimulant, stomachic and mildly tonic[4, 7, 21]. It is taken internally in the treatment of bronchial complaints, tension headaches, insomnia, anxiety, minor digestive upsets and painful menstruation[238]. It should not be prescribed for pregnant women[238]. Externally, it is used to treat muscular pain, bronchial complaints, arthritis, sprains and stiff joints[238]. The plant is harvested as flowering begins and can be used fresh or dried. Marjoram is often used medicinally in the form of the essential oil, about 400 grams being obtained from 70 kilos of the fresh herb[4]. The oil is used as an external application for sprains, bruises etc[4]. The essential oil is used in aromatherapy. Its keyword is 'Muscle relaxant'[210].

propta Seed - this species is a sterile hybrid and so does not produce seed. If you wanted to grow it from seed then you would need to hybridise *O. vulgare* x *O. majorana*. The resulting seedlings would be rather variable. Division in March or October. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings of young barren shoots in June. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Requires a rather dry, warm, well-drained soil, but is not fussy as to soil type[18], thriving on chalk[1, 37]. Prefers slightly alkaline conditions[200]. Plants are not hardy in all parts of Britain, they tolerate temperatures down to about -5°C, possibly lower if the roots are given a good

or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200].

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wind tolerant[1, 11]. An upright growing tree that does not produce suckers[183]. This species is closely related to *C. ferox*[11, 200]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

### 7.2.181 Crambe kotschyana

6 tin 9 cyuc 2 kcak 0 tcan 1 dwat 2.5 m hkuc hmimhtut cyutli kyucyuc hwicli hyishrasjlutnyik hpa7tli prikhlwis hpa7tmwatli xre7t hjonli

drutta Crambe kotschyana is a PERENNIAL growing to 2.5 m (8ft) by 2.5 m (8ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked[51]. Used as a vegetable[266]. Root - cooked[51, 145]. Used as a vegetable[266]. Nutritious[74].

tcanta None known

dwatta AntipruriticAntipruritic[145].

propta Seed - sow March/April in a seedbed outdoors and either thin the plants out or move them to their permanent positions when about 10cm tall[111]. The young plants are very attractive to slugs so some protection will often be needed. Germination can be slow so it is best to sow the seed in pots in a cold frame[164]. Germination usually takes place in 3 - 26 weeks at 15°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant out into their permanent positions when they are at least 10cm tall. Division in spring or autumn[1, 111]. Dig up the root clump and cut off as many sections as you require, making sure they all have at least one growing point. The larger of these divisions can be planted out straight into their permanent positions, though small ones are best potted up and grown on in a cold frame until they are established. Root cuttings, 3 - 10 cm long, in spring[104]. These can be planted straight into the open ground or you can pot them up in the greenhouse and plant them out once they are growing strongly.

nwatta An easily grown plant, succeeding in a good loam and an open sunny position[1]. Prefers a slightly alkaline soil in a position sheltered from strong winds[200]. Tolerates poor soil and some shade[200]. Dislikes acid soils[1]. Prefers a rather dry soil[187]. Plants are hardy to about -20°c[187]. A deep-rooted plant[233], it dislikes root disturbance[164]. Plants can be grown in the summer meadow if the grass is not cut too low (since this would damage the growing point)[200]. A good bee plant[74]. Very closely related to *C. cordifolia*[200] and considered by some botanists to be no more than a variety of that species, differing mainly in its larger flowers[1].

### 7.2.182 Crataegus apiifolia

Parsley-Leaved Hawthorn

6 tin 9 cyuc 2 kcak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikhlwis hpa7tmwatli xre7t hjonli

drutta Crataegus apiifolia is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy

to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Midges. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[183]. The fruit can be used in making pies, preserves, etc, and can also be dried for later use. About 7.5mm in diameter[200] with a thin flesh[227]. There are up to five fairly large seeds in the centre of the fruit, these often stick together and so the effect is of eating a cherry-like fruit with a single seed[K].

tcanta RootstockUsed as a dwarfing rootstock for *C. aestivalis*[183]. Wood - heavy, hard, strong, close-grained[82, 227, 235]. It weighs 46lb per cubic foot[227, 235]. It has no particular commercial value[227], though it is useful for making tool handles, mallets and other small items[82].

dwatta Cardiotoxic HypotensiveAlthough no specific mention has been seen for this species, the fruits and flowers of many hawthorns are well-known in herbal folk medicine as a heart tonic and modern research has borne out this use. The fruits and flowers have a hypotensive effect as well as acting as a direct and mild heart tonic[222]. They are especially indicated in the treatment of weak heart combined with high blood pressure[222]. Prolonged use is necessary for it to be efficacious[222]. It is normally used either as a tea or a tincture[222].

propta Seed - this is best sown as soon as it is ripe in the autumn in a cold frame, some of the seed will germinate in the spring, though most will probably take another year. Stored seed can be very slow and erratic to germinate, it should be warm stratified for 3 months at 15°c and then cold stratified for another 3 months at 4°c[164]. It may still take another 18 months to germinate[78]. Scarifying the seed before stratifying it might reduce this time[80]. Fermenting the seed for a few days in its own pulp may also speed up the germination process[K]. Another possibility is to harvest the seed 'green' (as soon as the embryo has fully developed but before the seedcoat hardens) and sow it immediately in a cold frame. If timed well, it can germinate in the spring[80]. If you are only growing small quantities of plants, it is best to pot up the seedlings as soon as they are large enough to handle and grow them on in individual pots for their first year, planting them out in late spring into nursery beds or their final positions. When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years.

nwatta A very easily grown plant, it prefers a well-drained moisture retentive loamy soil but is not at all fussy[11, 200]. Once established, it succeeds in excessively moist soils and also tolerates drought[200]. It grows well on a chalk soil and also in heavy clay soils[200]. A position in full sun is best when plants are being grown for their fruit, they also succeed in semi-shade though fruit yields and quality will be lower in such a position[11, 200]. Most members of this genus succeed in exposed positions, they also tolerate atmospheric pollution[200]. This species is not hardy in all parts of Britain, it usually succeeds outdoors for a number of years at Kew, but is killed in severe winters there[11]. It does not seem to fruit well in Britain[11]. The flowers have a foetid smell somewhat like decaying fish. This attracts midges which are the main means of fertilization. When freshly open, the flowers have more pleasant scent with balsamic undertones[245]. Hybridizes freely with other members of this genus[200]. Seedling trees take from 5 - 8 years before they start bearing fruit, though grafted trees will often flower heavily in their third year[K]. Seedlings should not be left in a seedbed for more than 2 years without being transplanted[11].

### 7.2.183 Ophrys apifera

Bee Orchid

6 tin 9 cyuc 2 kcak 0 tcan 2 dwat 0.5 m hkuc

in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[51, 105]. Rich in oil. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta OilNone known

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter or spring. Stored seed should be pre-soaked in warm water for 48 hours and then given 2 weeks warm followed by 3 - 4 months cold stratification[164]. Germinates in 1 - 6 months at 20°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame or sheltered place outdoors for their first winter. Plant them out into their permanent positions in late spring or early summer[K]. Layering in autumn. Easy, it takes about 6 months[78, 200].

nwatta An easily grown plant, it succeeds in most soils, but is in general more productive of seeds when grown on soils of moderate fertility[11, 200]. It does less well in rich heavy soils or poor ones[11, 63]. Does well in a loamy soil[11]. Very suitable for an alkaline soil[11], but it dislikes very acid soils[17]. Plants are fairly wind tolerant[1, 11]. This species is cultivated for its edible seed in Asia[51], it frequently sets fruit at Kew[11]. Closely allied to *C. colurna*[11], and considered to be no more than a sub-species by some botanists, it is an upright growing tree that does not produce suckers[183]. Members of this genus bear transplanting well and can be easily moved even when relatively large[11].

### 7.2.160 Allium kunthii

Kunth's onion

6 tin 9 cyuc 3 kcak 0 tcan 2 dwat 0.4 m hkuc

htut cyutli tcup hwicli hrasjlut hpa7tli flatprikhlwis hpa7tmwatli xre7t hjonli

drutta Allium kunthii is a BULB growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Bulb - raw or cooked. Used as a flavouring[177]. The small bulbs are usually less than 2cm in diameter[270]. Leaves - raw or cooked. Flowers - raw. Used as a garnish on salads.

tcanta RepellentThe juice of the plant is used as a moth repellent. The whole plant is said to repel insects and moles[20].

dwatta Although no specific mention of medicinal uses has been seen for this species, members of this genus are in general very healthy additions to the diet. They contain sulphur compounds (which give them their onion flavour) and when added to the diet on a regular basis they help reduce blood cholesterol levels, act as a tonic to the digestive system and also tonify the circulatory system[K].

propta Seed - sow spring in a cold frame. Prick out the seedlings into individual pots when they are large enough to handle - if you want to produce clumps more quickly then put three plants in each pot. Grow them on in the greenhouse for at least their first winter and plant them out into their permanent positions in spring once they are growing vigorously and are large enough. Division in spring. The plants divide successfully at any time in the growing season, pot up the divisions in a cold frame or greenhouse until they are growing well and then plant them out into their permanent positions.

nwatta Prefers a sunny position in a light well-drained soil[1]. The bulbs should be planted fairly deeply[11]. Most members of this genus are intolerant of competition from other growing plants[203]. Grows well with most plants, especially roses, carrots, beet and chamomile, but it inhibits the growth of legumes[18, 20, 54]. This plant is a bad companion for alfalfa, each species negatively affecting the

other[201]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.161 Alliaria petiolata

Garlic Mustard

6 tin 8 cyuc 3 kcak 1 tcan 2 dwat 1 m hkuc

pcimhmm cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikhlwis hpa7tmwatli fyikxre7t hjonli

drutta Alliaria petiolata is a BIENNIAL growing to 1 m (3ft 3in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to June, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: Flowers Leaves SeedpodEdible Uses: Young leaves - raw or cooked as a potherb or as a flavouring in cooked foods[4, 5, 9, 12, 62, 115, 244]. A mild garlic and mustard flavour, the leaves are also believed to strengthen the digestive system[244]. They can be finely chopped and added to salads[7, 183]. The leaves are available very early in the year and provide a very acceptable flavouring for salads in the winter[K]. Flowers and young seed pods - raw[62]. A mild, garlic-like flavour[K].

tcanta DyeA yellow dye is obtained from the whole plant[7].

dwatta Antiasthmatic Antiscorbutic Antiseptic Deobstruent Diaphoretic Eczema Sternumatory Vermifuge VulneraryGarlic mustard has been little used in herbal medicine[268]. The leaves and stems are antiasthmatic, antiscorbutic, antiseptic, deobstruent, diaphoretic, vermifuge and vulnerary[4, 7]. The leaves have been taken internally to promote sweating and to treat bronchitis, asthma and eczema[4]. Externally, they have been used as an antiseptic poultice on ulcers etc[4], and are effective in relieving the itching caused by bites and stings[244]. The leaves and stems are harvested before the plant comes into flower and they can be dried for later use[238]. The roots are chopped up small and then heated in oil to make an ointment to rub on the chest in order to bring relief from bronchitis[245]. The juice of the plant has an inhibitory effect on *Bacillus pycocyanoid* and on gram-negative bacteria of the typhoid-paratyphoid-enteritis group[240]. The seeds have been used as a snuff to excite sneezing[4].

propta Seed - sow outdoors in situ either in spring or autumn.

nwatta Prefers a damp rich alluvial soil[7, 53]. Succeeds in damp shady places where few other herbs will grow[238]. A good woodland edge plant, it also grows well in the bottom of hedgerows[24] and will self-sow freely in suitable conditions[238]. On a calm day the plant emits a strong smell of garlic. This is especially pronounced if the leaves are bruised[245]. This species is an important food source for the orange-tip butterfly[238]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [2-1].

### 7.2.162 Yushania maculata

Maculata bamboo

6 tin 10 cyuc 3 kcak 3 tcan 0 dwat m hkuc hmimhtut cyutli hgattcuphja7n hwicli hrasjlutnyik hpa7tli flatprikhlwis hpa7tmwatli hjonli

drutta Yushania maculata is an evergreen Bamboo growing to 5 m (16ft) by 2.5 m (8ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. The flowers are pollinated by Wind. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and

can tolerate drought. The plant can tolerates strong winds but not maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Young stems. Shoots emerge summer to early autumn. Shoots have pleasant taste and are free of bitterness[1-9]. Harvested shoots are steamed, cut lengthwise, cleaned and sterilized for 15 minutes in pure or salted boiling water before eating or canning[ 310 ].

tcanta Canes are used as plant supports, they must be properly ripened[25, 158, 195]. The plant makes an attractive hedge or screen, eventually becoming very dense[195]. Erosion Control. Suggested landscape design uses: Ornamental - bluey-green canes and the shape looks like a waterfall of leaves, Architectural, Hedging/Screens, tropical garden effect, Roof terrace. Wildlife Shelter for birds and small mammals. Drought- and wind-tolerant.

dwatta None Known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20?c. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Grow on in a lightly shaded place in the greenhouse until the seedlings are large enough to plant out, which could take a few years. Seed is rarely available. Division in late spring[25]. Best done as the new shoots first appear above ground[25]. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings[25].

nwatta Yushania maculata is a large and fast-growing perennial bamboo forming clumps of blue stems with reddish clum sheaths and sparse narrow, glossy green leaves. A temperate plant growing in pine forests 1,800-3,500m above sea level. Canes are 1-2cm diameter and 3-5m high. The Yushania genus are a large group of spreading thornless frost-hardy bamboos. Yushania has long-necked rhizomes that enable the plants to spread further, giving it a semi-running habit under suitable conditions. The name Yushania refers to the mountain 'Yu Shan' of the central mountain range of Taiwan. Yushania maculata has attractive bluey-green canes with the plant shape looks like a waterfall of leaves. pH Range: 5.5 to 6.5. Soil Range: Sandy Loam to Clay Loam. Water Range: Normal to Moist. Drought- and wind-tolerant, it grows up to 3.5m (12ft) in 10 years. Light: Partial Shade, Full Shade, Full Sun but prefers full sun to light shade. It does poorly in high Heat and high Humid conditions (e.g. southeast USA).

### 7.2.163 Bunias erucago

Corn Rocket, Crested wartycabbage

6 tlin 9 cyuc 3 kcak 0 tcan 0 dwat 0.6 m hkuc htut cyutli tcup hwicli hyishrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Bunias erucago is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Leaves and young stems - raw or cooked[2, 64, 61, 105, 177]. A characteristic aromatic flavour that goes well with beans[183]. The young and tender leaves make a refreshing spring soup[89, 183]. Root - raw[17, 264]. It can be sliced thinly or grated and then be added to salads[89].

tcanta None known

dwatta None known

propta Seed - sow March to August in situ in order to obtain a succession of fresh young leaves. The seed usually germinates within 2 weeks.

nwatta Succeeds in most soils[1], including poor ones[132], preferring a sunny position[200].

### 7.2.164 Imperata cylindrica

Cogongrass, Japanese Blood Grass

6 tlin 9 cyuc 3 kcak 0 tcan 3 dwat 1.2 m hkuc htut cyutli hgatkycutcup hwicli hyishrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Imperata cylindrica is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8 and is frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: SaltYoung inflorescence and young shoots - cooked[177, 179]. Root - fibrous but pleasant to chew, containing starch and sugar[144, 177, 179]. Fairly sweet, the taste is sweetest in the wet season in Australia and worst from plants growing in sand[193]. The ash of the plant is used as a salt substitute[177].

tcanta Paper Soil stabilization Stuffing Thatching WeavingThe leaves are woven to make mats, bags and rain-coats[46, 61, 193]. The inflorescences are valued for stuffing pillows and cushions[272]. The stems are used in thatching roofs[46, 61, 178, 272]. A fibre obtained from the leaves is used in making paper[46, 61, 154]. Can be planted on sandy soils to prevent erosion[154, 272]. The plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover[200].

dwatta Anthelmintic Antibacterial Antinivous Astringent Cancer Diuretic Dysentery Emollient Febrifuge Restorative Sialagogue Styptic Tonic UrinaryThe flowers and the roots are antibacterial, diuretic, febrifuge, sialagogue, styptic and tonic[147, 176, 178]. The flowers are used in the treatment of haemorrhages, wounds etc[218]. They are decocted and used to treat urinary tract infections, fevers, thirst etc[147, 218]. The root is astringent, antifebrile, antinivous, diuretic, emollient, haemostatic, restorative and tonic[218, 240]. It is used in the treatment of nose bleeds, haematuria, haematemesis, oedema and jaundice[176]. The root has antibacterial action against Staphylococcus aureus, Bacillus dysenteriae etc[176]. A decoction of the root is used as an anthelmintic and also to treat digestive disorders such as indigestion, diarrhoea and dysentery[272]. The root bark is febrifuge, restorative and tonic[218]. Extracts of the plant have shown viricidal and anticancer activity[218].

propta Seed - surface sow in spring in a greenhouse. The seed germinates quickly, prick out the seedlings into individual pots when they are large enough to handle and plant them out in the summer. Division in spring as the plant comes into growth. Division is very easy and can be carried out at almost any time in the year, though winter divisions are best potted up in the greenhouse and planted out in late spring[K].

nwatta Landscape Uses:Alpine garden, Border, Massing, Rock garden, Specimen. Succeeds in ordinary garden soil in sun or partial shade[162, 187]. This species is only hardy in the southern part of Brtain, tolerating temperatures down to about -15°c when dormant[187], though the young growth in spring can be damaged by late frosts. The var. I. cylindrica major. (Nees.)C.E.Hubb. is used medicinally in China[176] and as a wild food in Australia[193]. This species is quite closely related to sugar cane, it has been interbred experimentally with that species in India[193]. Plants grow away vigorously after a fire, often spreading freely to infest the burnt areas[144, 193]. Special Features:Attractive foliage, There are no flowers or blooms.

### 7.2.165 Brassica napus pabularia

Rape Kale

6 tlin 9 cyuc 3 kcak 0 tcan 2 dwat 1.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikrip hpa7tli frusflat-prikliwsslip hpa7mwatli fyifxre7t hjonli

drutta Brassica napus pabularia is a ANNUAL/BIENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost

pots when they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in early summer and give some protection for their first winter outdoors. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame. Overwinter in the greenhouse and plant out in late spring[11, 78]. Good percentage[78]. Layering of long shoots in the autumn[200].

nwatta Succeeds in any fertile garden soil[182]. Requires a sheltered position in a moderately fertile well-drained neutral to acid soil[200]. Prefers a position in semi-shade[219]. This species is not very hardy in Britain, though it succeeds when grown against a sunny wall in the milder areas of the country[182]. The flowers emit a soft sweet perfume[245]. Flowers are produced on the current year's growth[219]. Plants do not really require pruning[219]. Dioecious, male and female plants must be grown if fruit and seed is required[182].

### 7.2.178 Clinopodium chinense

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Clinopodium chinense is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - cooked[105, 177]. A sweet and aromatic herb tea is made from the leaves[200].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame. Only just cover the seed. Germination usually takes place within 2 weeks at 21°c. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse. Plant them out in the summer if they have made sufficient growth, otherwise plant them out in late spring or early summer of the following year. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Cuttings of soft wood in May or June.

nwatta Succeeds in almost any well-drained soil[1]. A polymorphic species[58]. Plants are best grown in a rock garden[1].

### 7.2.179 Physalis alkekengi

Winter Cherry, Strawberry groundcherry,Ground Cherry, Chinese Lantern
6 tlin 9 cyuc 2 kcak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Physalis alkekengi is a PERENNIAL growing to 0.3 m (1ft) by 0.6 m (2ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[1, 2, 105]. Rich in vitamins[100], with twice the vitamin C of lemons[179], but not much taste[178]. Another report says that they are juicy but with a bitter acid flavour[4], whilst another says that they add a delicious flavour to salads[7]. We have found them to be bitter and rather unpleasant[K]. The fruit is a berry about 17mm in diameter[200]. The plant conveniently wraps up each fruit in its own 'paper bag' (botanically, the calyx) to protect it from pests and the elements. This calyx is toxic and should not be

eaten[34, 65]. Young leaves - cooked[105, 170, 179]. Caution is advised, the leaves are almost certainly poisonous, at least when raw.

tcanta None known

dwatta Antiphlogistic Antirheumatic Antitussive Aperient Diuretic Expectorant Febrifuge Homeopathy Lithontripic Malaria Urinary Vitamin CThe plant has a long history of herbal use, and an interesting chemistry, but it is seldom used in modern practice[238]. The whole plant is antiphlogistic, antipyretic, antitussive and expectorant[9, 61, 147, 178, 218]. It has been used in the treatment of urinary and skin diseases[240]. Some caution is recommended since an overdose of the plant is said to easily precipitate an abortion[218]. The fruit is aperient, strongly diuretic and lithontripic[4, 7, 9, 218]. It is used internally in the treatment of gravel, suppression of urine etc and is highly recommended in fevers and in gout[4, 238]. The fruit is harvested when fully ripe and can be used fresh, juiced or dried[238]. The calyx should be removed[238]. The leaves and stems are febrifuge and slightly tonic[4]. They are used in the treatment of the malaise that follows malaria, and for weak or anaemic people[4]. The fresh leaves have been used externally to make soothing poultices in the treatment of skin inflammations[238, 244]. The seed is used to promote early labour[218]. A homeopathic remedy is made from the fruit. It is used in the treatment of kidney and bladder disorders[9].

propta Seed - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out in early summer. Diurnal temperature fluctuations assist germination[170]. Division in spring[111]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in early summer[111]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Border, Container. Succeeds in any well-drained soil in full sun or light shade[111, 200]. The fully dormant plant is hardy in most of Britain, though the young growth in spring can be damaged by late frosts. A very ornamental plant[1] though it can be invasive[200]. The subspecies P. alkekengi francheti. Mak. (sometimes treated as a separate species) is a more vigorous form of the species with larger fruits[200]. Slugs are very fond of the new growth in spring and can destroy even quite large clumps[K]. Special Features: Naturalizing, Suitable for dried flowers.

### 7.2.180 Corylus tibetica

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwsslip hpa7tmwatli fyif hjonli

drutta Corylus tibetica is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: Oil SeedEdible Uses: OilSeed - raw or cooked[63, 105, 146, 177]. Rich in oil. The seed, in its shell, is about 10 - 15mm in diameter[266]. The seed ripens in mid to late autumn and will probably need to be protected from squirrels[K]. When kept in a cool place, and not shelled, the seed should store for at least 12 months[K]. An edible oil is obtained from the seed.

tcanta OilNone known

dwatta None known

propta Seed - best sown as soon as it is harvested in autumn in a cold frame[164]. Germinates in late winter

plants must be grown if seed is required). and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. Used like huckleberries[11, 69, 177]. The fruit is up to 22mm in diameter[200].

tcanta None known  
dwatta None known

propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°c, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins. 'Drop' the plants 12 months earlier by digging them up and replanting them deeper in the soil so that the branches are buried and can form roots. This works best in a sandy soil[78]. It is best to pot up the divisions and grow them on in a lightly shaded position in a greenhouse until they are established. Plant them out in the summer. Layering in September/October. Takes 12 months[78].

nwatta Requires a light moist but well-drained humus-rich lime-free soil in sun or semi-shade[1, 11]. Grows well in a rock garden[11]. Fruits are produced abundantly on plants growing in the wild[11]. Dioecious. Male and female plants must be grown if seed is required. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.175 Adenophora denticulata

6 tlin 9 cyuc 2 kcak 0 tcan 0 dwat 0.5 m hkuc  
htut cyutli tcup hwicli hrasljut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Adenophora denticulata is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. A sweet flavour[74].

tcanta None known  
dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°c[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Intolerant of root disturbance[1]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K].

## 7.2.176 Codonopsis lanceolata

TodoK

6 tlin 9 cyuc 2 kcak 0 tcan 2 dwat 1.5 m hkuc

hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Codonopsis lanceolata is a PERENNIAL CLIMBER growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, wasps. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[105, 177]. The plant produces thick tubers[275]. Young plant - raw or cooked[105, 177]. A nutritional analysis is available[218].

tcanta None known

dwatta Aphrodisiac Depurative Emmenagogue Galactogogue TonicAphrodisiac, tonic[46, 61]. The root is anticancer, depurative, emmenagogue and galactogogue[147, 218]. A decoction is used in the treatment of lung abscesses, milk-flow obstruction, amenorrhoea, acute and inflamed boils and abscesses and lymphadenopathy[147].

propta Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to cause the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

nwatta Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. Plants only succeed in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Dormant plants are hardy to about -20°c[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A lot of confusion exists over the correct authorship of this specific name. Apart from the one mentioned above there are also: -(Sieb. and Zucc.)Trautv.; Benth.; and Benth. and Hook. A climbing plant, supporting itself by twining and scrambling over other plants[219]. The plant resents root disturbance and should be planted out into its permanent position as soon as possible[164]. Plants are very susceptible to the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K]. It is best grown on a high bank in order to give a good view of the flowers[1].

## 7.2.177 Kadsura japonica

6 tlin 9 cyuc 2 kcak 0 tcan 1 dwat 3.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Kadsura japonica is an evergreen climber growing to 3.5 m (11ft 6in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[177]. The fruit is up to 6mm long[219].

tcanta None known

dwatta Antidiarrhoeal Stomachic TonicA decoction of the dried fruits is bechic, stomachic and tonic[218].

propta Seed - best sown when it is ripe in the autumn in a cold frame[200]. Prick out the seedlings into individual

tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Oil OilEdible Uses: Oil OilLeaves - raw or cooked[4, 34, 37]. Added to salads or used as a potherb[183]. Immature flowering stems - cooked in much the same way as broccoli[183]. An edible oil is obtained from the seed, it is used mainly for cooking purposes, but also for salads[4, 13, 34, 46, 183]. Some caution is advised, see the notes above on toxicity. The sprouted seed is often used as the mustard part of mustard and cress. Eaten in salads[4, 34, 37, 183]. The seed is used as a mustard flavouring[183].

tcanta Oil OilThe seed contains up to 45% of an edible semi-drying oil, it is used as a luminant, lubricant, in soap making etc[13, 21, 57, 142].

dwatta Diuretic EmollientThe root is emollient and diuretic[240]. The juice of the roots is used in the treatment of chronic coughs and bronchial catarrh[240, 269]. The seed, powdered, with salt is said to be a folk remedy for cancer[269]. Rape oil is used in massage and oil baths, it is believed to strengthen the skin and keep it cool and healthy. With camphor it is applied as a remedy for rheumatism and stiff joints[269].

propta Seed - sow spring in situ.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Succeeds in any reasonable soil[52]. Prefers a heavy soil and cool moist conditions[16, 20]. Tolerates a pH in the range 4.2 to 8.3. Very young plants are susceptible to cold damage, -4°C either killing or injuring seedlings, whereas -2°C has no effect when the plants are more than one month old[269]. The rape kales have non-tuberous roots. They are cultivated for their edible leaves. Plants are intolerant of root disturbance and so should not be transplanted[200]. Rape kale is 70% self-pollinating and 30% cross-pollinated. Even if wind and insects are absent, seed are still produced. Yield increases with honeybees[269]. The growth of this plant is inhibited by field mustard and hedge mustard growing nearby[18, 20]. This species is closely related to *B. rapa*[200].

## 7.2.166 Ornithogalum umbellatum

Star Of Bethlehem, Dove's Dung

6 tlin 9 cyuc 3 kcak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Ornithogalum umbellatum is a BULB growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers RootEdible Uses: Bulb - raw or cooked[2, 5, 46, 61, 183]. The bulbs can be dried and ground into a powder[207]. Whilst the bulbs are palatable and wholesome according to some reports[2, 4, 115], some caution is advised. See the notes above on toxicity. Flowers - baked in bread[183].

tcanta None known

dwatta BachA homeopathic remedy is made from the bulbs[4]. It is useful in the treatment of certain forms of cancer[4]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'After effect of shock, mental or physical'[209]. It is also one of the five ingredients in the 'Rescue remedy'[209].

propta Seed - best sown as soon as it is ripe in a cold frame[200]. Sow the seed thinly and leave the seedlings undisturbed in the pots for their first dormancy, but apply liquid feed at intervals, especially in their second year of growth. Divide the bulbs at the end of their second year of

growth, putting 2 - 3 bulbs in each pot. Grow them on for one more year and then plant them out into their permanent positions whilst they are dormant. The seed can also be sown in a cold frame in early spring. Division of offsets in September/October[200]. The larger bulbs can be replanted immediately into their permanent positions. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in late summer.

nwatta Landscape Uses:Border, Container, Woodland garden. An easily grown plant, succeeding in an ordinary garden soil[1, 42]. Tolerates partial shade[200]. Hardy to about -20°c[200]. The dormant bulbs are very hardy and will withstand soil temperatures down to at least -10°c[214]. A very ornamental plant[1], but it can be invasive where conditions suit it[200]. It can be naturalized in short turf or thin grass below shrubs[200], though this should not be mown from the time the bulbs start to grow until they have set seed and the leaves are dying down. Special Features:Not North American native, Invasive, Naturalizing, Suitable for cut flowers.

## 7.2.167 Acorus gramineus

Grass-leaved Sweet Rush, Japanese Sweet Flag, Dwarf Sweet Flag

6 tlin 10 cyuc 3 kcak 0 tcan 3 dwat 0.3 m hkuc  
htut cyutli tcupha7nhs6s hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Acorus gramineus is an evergreen Perennial growing to 0.3 m (1ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf all year, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: RootEdible Uses: CondimentRoot - raw or cooked[105, 177]. It should be peeled, finely chopped and soaked in several changes of water first[183]. A stronger and more pleasing taste than *A. calamus*[2, 183]. The root is also used as a ginger substitute[177]. Some caution is advised, see the notes above on toxicity.

tcanta Essential Insecticide Parasiticide RepellentThe dried root repels insects[178]. It is probably also insecticidal[178, 240] and is used in Vietnam to kill lice, bugs and fleas[283]. An essential oil is obtained from the plant[240]. A useful ground cover plant, forming a spreading clump[208].

dwatta Anodyne Antibacterial Antifungal Antiperiodic Antirheumatic Antispasmodic Aromatic Cardiac Carminative Diaphoretic Diuretic Emmenagogue Epilepsy Expectorant Fibrifuge Parasiticide Sedative Stimulant Stomachic Tonic VermifugeThe root is antifungal, antibacterial, antiperiodic, antirheumatic, antispasmodic, aromatic, cardiac, carminative, diaphoretic, emmenagogue, fibrifuge, sedative, stimulant, stomachic, tonic and vermifuge[4, 7, 9, 21, 61, 147, 165, 176, 178, 218, 238, 240, 279]. It is also powdered and applied to bleeding gums[218, 238]. It is used internally in the treatment of digestive problems - particularly gastralgia and diarrhoea[283], cough, bronchial asthma, neurasthenia, depression, epilepsy etc[176, 238, 283]. Externally, it is used to treat body parasites, dermatosis and haemorrhoids[283]. The root can be harvested at any time of the year, except when the plant is in flower[238]. The root contains an essential oil consisting of asarone and asaryl aldehyde, plus a bitter glucoside acorin[176, 283]. Asarone increases the hypnotic effect of barbiturates and ethanol, lowers blood pressure and is antibacterial against *Staphylococcus aureus*, streptococci and mycobacterium[176]. The whole plant is anodyne, antiperiodic, antispasmodic, digestive, diaphoretic, diuretic, expectorant, sedative, stimulant, stomachic, sudorific, tonic, vermifuge[218].

propta Seed - best sown in a cold frame as soon as it is ripe. Stand the pot in about 3cm of water. Pot up young seedlings as soon as they are large enough to handle, keep them wet by standing the pots in shallow water and overwinter for the first year in a greenhouse or cold frame. Division in spring just before growth starts[1]. Very easy, the plants can be divided at any time in the growing season and can be planted direct into their permanent positions[K].

nwwatta Landscape Uses:Container, Foundation, Ground cover, Massing, Rock garden, Seashore. Grows well in shallow water margins of ponds etc[1, 2], though it can also succeeds in drier habitats[56]. Requires a sunny position[200]. A very ornamental plant, there are some named varieties[208, 238]. The cultivar ‘Pusillus’ can be grown as a submerged aquatic plant[238]. Special Features:Attractive foliage, Fragrant foliage, Not North American native, Naturalizing, Wetlands plant, Inconspicuous flowers or blooms.

## 7.2.168 Tulipa edulis

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli tcup hwcili hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Tulipa edulis is a BULB growing to 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from March to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Bulb - cooked[22, 105]. A source of starch[46, 61]. The bulb can be up to 4cm in diameter[266]. Leaves - cooked[46, 61, 105]. Unless you have more plants than you need this practise is not recommended since it will greatly weaken the plant[K]. tcanta None known

dwatta Antidote Antipyretic Cancer Depurative Expecto- rant Febrifuge LaxativeThe inner portion of the bulb is anti- dote, antipyretic, depurative, expecto- rant, febrifuge and lax- ative[147, 218]. It is used, mainly as a poultice, in the treat- ment of ulcers and abscesses[147]. The plant has been used in the treatment of cancer[218]. The leaves are applied exter- nally to abscesses, buboes and breast diseases[218]. The flowers are used in the treatment of dysuria[218].

propta Seed - best sown in a shady part of the cold frame as soon as it is ripe in early summer[1], or in the early autumn[200]. A spring sowing of stored seed in the greenhouse also succeeds[K]. Sow the seed thinly so that the seedlings can be grown on without disturbance for their first growing season - apply liquid feeds to the pot if necessary. Divide the bulbs once the plants have become dormant, putting 3 - 4 bulbs in each pot. Grow the on in the greenhouse for at least the next year, planting them out when dormant. Division of offsets in July. Larger bulbs can be planted out straight into their permanent positions, or can be stored in a cool place and then be planted out in late autumn. It is best to pot up smaller bulbs and grow them on in a cold frame for a year before planting them out when they are dormant in late sum- mer to the middle of autumn.

nwwatta Easily grown in a well-drained soil in a sunny position[1, 90]. This species is not fully hardy in Britain, the plants come into growth in the winter and need protection from severe weather and so are best grown in a bulb frame[1]. Plants are dormant in summer but do not require protection from rain[90]. Bulbs can be harvested in June af- ter they have died down and then stored in a cool dry place, being planted out again in October.

## 7.2.169 Glaucium flavum

Horned Poppy, Yellow hornpoppy

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli hgatkuyctucp hwcili hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Glaucium flavum is a PERENNIAL growing to 0.6 m (2ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Oil OilEdible Uses: Oil OilA clear yellow edible oil is obtained from the seed[2, 46, 61, 183].

tcanta Oil OilAn oil obtained from the seed is used for as a fuel for lighting, it burns cleanly[2]. It is also used in soap making[46].

dwatta PoulticePoultice[66].

propta The seed can be sown in the middle of spring or in autumn in a cold frame. A period of cold stratification improves germination. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts[1]. If you have sufficient seed it should be worthwhile trying an outdoor sowing in situ in mid spring[1].

nwwatta Easily grown in any good well-drained soil[1, 200]. Requires a very well-drained poor soil[187]. Prefers a hot dry position[166] and dislikes shade[200]. A very or- namental but short-lived perennial[1], it is hardy to about -10°C[187]. Plants are resentful of root disturbance and should be placed in their final positions as soon as possible[200]. Flowers are produced in the first year from seed[200].

## 7.2.170 Acer palmatum

Japanese Maple

6 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwcili hrasljutnyikfrip hpa7tli frusflat- prikliwis hpa7tmwatli hjonli

drutta Acer palmatum is a deciduous Tree growing to 8 m (26ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves SapEdible Uses: The sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[105, 177, 183]. The syrup is used as a sweet- ener on many foods. The concentration of sugar is consid- erably lower than in the sugar maples (A. saccharum). The tree trunk is tapped in the early spring, the sap flowing bet- ter on warm sunny days following a frost. The best sap pro- duction comes from cold-winter areas with continental cli- mates. Leaves - cooked[105, 177, 179]. We have eaten nicer leaves[K].

tcanta PreservativeThe leaves are packed around ap- ples, rootcrops etc to help preserve them[18, 20].

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be har- vested ‘green’ (when it has fully developed but before it has dried and produced any germination inhibitors) and sown im- mediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their per- manent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Only strong-growing cultivars succeed from cuttings, plants of the dissected or variegated cultivars will rarely grow into good plants.

nwwatta Landscape Uses:Border, Pest tolerant, Rock gar- den, Standard, Specimen, Woodland garden. Of easy cul- tivation, it succeeds in most soils preferring a good moist well-drained soil on the acid side and partial shade[11, 182].

Grows well in heavy clay soils. Chlorosis can sometimes de- velop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Requires some shelter in the cooler areas of Britain and protection from cold drying winds[1]. Plants are hardy to about -25°C[184], but spring growth is subject to damage by late frosts[11]. A very ornamental tree[1], it is a poly- morphic species[1] and there are many named varieties[11, 182]. Grows well with rhododendrons. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 7.2.171 Viburnum japonicum

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc hmimhtut cyutli tcup hwcili hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli dyatre7t hjonli

drutta Viburnum japonicum is an evergreen Shrub grow- ing to 1.8 m (6ft) at a slow rate. See above for USDA hardi- ness. It is hardy to UK zone 7. It is in leaf all year, in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and ba- sic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105, 177]. The ovoid fruit is about 8mm long and contains a single large seed[200]. Leaves - cooked. A famine food, they are only used when all else fails[179].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested ‘green’ (when it has fully developed but before it has fully ripened) and sown immedi- ately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cut- tings of half-ripe wood, 5 - 8 cm long with a heel if possi- ble, July/August in a frame[78, 113]. Plant them into indi- vidual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a green- house or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if suf- ficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwwatta An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Requires woodland conditions but without competition from other plants. Best if given shade from the early morning sun in spring[200]. This species is hardy at Kew Botani- cal Gardens but it prefers a warmer climate[11]. Plants are slow-growing in Britain[219], they probably do best if given a warm position against a sunny wall[219]. Plants are self- incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. A foetid smelling plant[58], but the flowers are very fragrant with a jonquil-like scent[219, 245]. This species is closely related to *V. odoratissimum*[1].

## 7.2.172 Duchesnea filipendula

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc htut cyutli tcup hwcili hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfixre7t hjonli

drutta Duchesnea filipendula is a PERENNIAL growing to 0.1 m (0ft 4in) by 1 m (3ft 3in). See above for USDA hardi- ness. It is hardy to UK zone 7. It is in flower from May to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[61, 177]. The fruit has the appearance and texture of a strawberry but very little flavour[K].

tcanta None known

dwatta None known

propta Seed - sow spring in a sunny position in a green- house. Germination usually takes place within 1 - 6 weeks or more at 15°C. A period of cold stratification may speed up germination. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division of runners in spring or late summer. Very easy, they can be planted out straight into their permanent positions.

nwwatta We have very little information on this species and do not know if it will be hardy in Britain. Judging by other members of this genus it probably prefers a moist but well- drained soil in a sunny position and grows well in a rock gar- den. This species is cultivated for its edible fruit in China[61].

## 7.2.173 Aquilegia shockleyi

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcup hwcili hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Aquilegia shockleyi is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: Flowers - raw. Rich in nectar, they are sweet and delightful[172], they make a very attractive addition to mixed salads and can also be used as a thirst-quenching munch in the garden[K].

tcanta Parasiticide ParasiticideThe seed is used as a pa- rasiticide to rid the hair of lice[172].

dwatta Antispasmodic Diaphoretic Parasiticide Parasi- ticide Resolvent SalveAntispasmodic, diaphoretic, parasi- ticide, resolvent, salve[172].

propta Seed - best sown as soon as it is ripe in a cold frame. The seed can be slow to germinate[200]. Stored seed can be sown in late winter in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter. Plant out in late spring or early summer. Division in spring[200].

nwwatta Succeeds in ordinary garden soil, preferring a moist but not wet soil and a sunny position[1]. Intolerant of heavy clay[200]. Most species are short-lived, dying out after 2 - 3 years, though they usually produce seed prolifically[200]. However, they are very apt to hybridize with other members of the genus and so it becomes difficult to keep a species true to type if more than one is grown in the garden[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.174 Gaultheria pumila

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcup hwcili hrasljut hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta Gaultheria pumila is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.6 m (2ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female



kcakta Edible Parts: FruitEdible Uses: The following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Fruit - raw or cooked[2, 105, 146, 158, 200, 218]. The fruit is about 6mm in diameter[200].

tcanta WoodThe following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Wood - hard, close grained, warps badly[158]. It makes a good charcoal[146, 158].

dwatta Anodyne Astringent Dysentery TonicThe following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Anodyne, astringent, tonic[178]. The wood is anodyne and a uterosedative[218]. The stem bark is used in the treatment of dysentery[218].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame[188]. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188], growing well in thin woodland[11]. This species is closely related to *C. macrophylla*[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.406 Cardamine trifolia

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc pcmhmm cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Cardamine trifolia is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to June, and the seeds ripen from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: We have no information on this species but the leaves are almost certainly edible either raw or cooked[K].

tcanta An excellent ground cover for woodland or under shrubs[208]. Plants should be spaced about 30cm apart each way[208].

dwatta None known

propta Seed - sow spring in a cold frame. Germination usually takes place within 1 - 3 weeks at 15°C[175]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in a greenhouse or cold frame for the first two years, planting them out when dormant in late summer. Division in early spring or after the plant dies down in the summer. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils so long as they are not dry[1]. Prefers a moist humus rich soil in shade or semi-shade[200]. A mat-forming stoloniferous species[200].

## 7.2.407 Saxifraga cortusifolia

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc hnmim cyutli tcuphja7n hwicli hrasljutnyk hpa7tli flatprikliw

hpa7tmwatli xre7t hjonli

drutta Saxifraga cortusifolia is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[177].

tcanta None known

dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in the spring. Surface sow, or only just cover the seed, and make sure that the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Prefers a cool position in a moist humus-rich soil[1]. Prefers an acid soil[200]. Grows well in light woodland[200] or in a shady position in the rock garden. This species is not very hardy in Britain according to one report[1], whilst another says that it is in climatic zone 7 and should therefore succeed outdoors in most parts of this country[200]. However, the leaves and the flowers are liable to be frost-damaged by autumn frosts[200]. A polymorphic species[1], it is closely related to *S. stolonifera*, differing in not having runners[200].

## 7.2.408 Geum japonicum

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hnmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Geum japonicum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: The plant is edible[46, 105]. No further details are given.

tcanta None known

dwatta Astringent Diuretic PouliticeThe root is used as a poultice, applied externally to boils and ulcers[178, 218]. The whole plant is diuretic and astringent[222]. It is cooked with other foods as an astringent in the treatment of coughs and haemoptysis[218].

propta Seed - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer' Division in spring or autumn. This should be done every 3 - 4 years in order to maintain the vigour of the plant[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Easily grown in any moderately good garden soil that is well-drained[1]. Prefers a soil rich in organic matter[200]. Hybridizes freely with other members of this genus[200].

## 7.2.409 Iberis amara

Rocket Candytuft, Annual candytuft  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.3 m hkuc htut cyutli kyuctcup hwicli hyishrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Bumelia lycioides* is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[177]. No further details. The fruit has a thick flesh and is about 10mm in diameter[82, 200].

tcanta WoodWood - heavy, hard, not strong, close grained[82, 229]. It weighs about 46lb per cubic foot[235]. Of no commercial value, it is used for tool handles, cabinet making etc[82, 229].

dwatta None known

propta Seed - we have no details on this species but would suggest that if ripe seed can be obtained it should be sown straight away in a cold greenhouse. Stored seed can be sown in late winter or early spring in a greenhouse. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in a warm sunny site in any freely draining moderately fertile soil[200]. Plants are cut back by temperatures below about -15°C but they regenerate freely from the base [200]. Succeeds outdoors at Kew[11], though it is not very vigorous[K]. This species rarely, if ever, fruits in Britain[11]. The tree at Kew flowered freely in the long hot summer of 1989 but did not produce fruit[K].

## 7.2.250 Oenothera elata hookeri

Hooker's Evening Primrose  
6 tlin 9 cyuc 2 kcaak 2 tcan 1 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Oenothera elata hookeri* is a BIENNIAL/PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies), bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves Root SeedpodEdible Uses: Root - cooked. Boiled and eaten like parsnip[183]. Young shoots - raw or cooked. Added to salads or boiled as a potato[183]. They are usually blanched before use[183]. A mucilaginous texture. The young pod-like fruits can be eaten when cooked[183].

tcanta None known

dwatta PouliticeThe plant has been used in the treatment of colds[257]. A poultice of the roots or the leaves has been used in the treatment of sores and swellings[257].

propta Seed - sow in situ from late spring to early summer.

nwatta Prefers a dryish well-drained sandy loam and full sun. Heavy clay soils may induce winter rots. Succeeds on poor soils. The flowers open in the evening, they are richly scented and are very attractive to moths. The seeds are a good food source for birds, especially finches. Plants usually mutate freely. This species is very closely related to, and perhaps no more than a part of, *O. biennis*[204]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 7.2.251 Satureja thymbra

Thyme-Leaved Savory  
6 tlin 9 cyuc 2 kcaak 3 tcan 2 dwat 0.4 m hkuc

hnmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Satureja thymbra* is a SHRUB growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: Condiment TeaThe leaves have a thyme-like flavour and are used as a seasoning for pulses, savoury breads, brine-cured olives, vegetables etc[4, 177, 183, 238]. The leaves and young shoots are used as a tea substitute. It is said that this make one of the best-tasting of all herb teas[183].

tcanta Cleanser EssentialA strong infusion of the herb is used in the autumn to clean wine barrels in preparation for the new vintage[183]. An essential oil is obtained from the plant, it contains 19% thymol[4] and is also rich in carvacrol[238]. It is used in the pharmaceutical industry[238]. A good bee plant[148]. Members of this genus are rarely if ever troubled by browsing deer[233]. Dynamic accumulator.

dwatta Antibacterial Aromatic Digestive Expectorant TonicThe leaves are antibacterial, aromatic, digestive, expectorant and tonic[148, 238]. They are used internally to treat minor digestive discomfort and bronchial congestion[238]. The leaves are harvested during the growing season and can be used fresh or dried[238].

propta Seed - surface sow in April in a greenhouse. Do not allow the compost to dry out. Germination can be slow and erratic[1] but usually takes place within a month[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle. It is usually possible to plant out into their permanent positions during the summer, but if the plants have not grown sufficiently, or if you live in an area of cold winters, it might be best to grow them on in a cold frame for their first winter and plant them out in late spring or early summer of the following year[K]. Cuttings of half-ripe wood, 5 - 8cm taken at a node, July/August in a frame. Pot up in autumn and overwinter in a frame, planting out in late spring or early summer of the following year. A high percentage usually succeed[78]. Cuttings of young wood, preferably with a heel, April/May in a frame[1, 37]. Plant out in the summer if the plants grow well, otherwise overwinter them in a cold frame and plant out in late spring or early summer of the following year[K]. Division in early spring as growth commences[78, 200]. This works best if soil has been mounded up into the bottom 20cm of the plant early in the previous summer[78]. Pot up the divisions and grow them on in a cold frame until they are established. Plant them out in the summer.

nwatta Requires a sunny position in a well-drained soil[200]. Plants are intolerant of soils that remain damp[200]. Prefers a neutral to alkaline soil[238]. This species is not very hardy outdoors in Britain, plants suffer damage at temperatures below freezing but they can be grown as annuals, flowering and setting seed in their first year[200]. Plants will be hardier in soils that are very well drained and also if the soil is a bit on the poor side[K].

## 7.2.252 Arisaema tortuosum

Arisaema  
6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc pcmhmmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli dyat hjonli

drutta *Arisaema tortuosum* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Tuber - it must be thoroughly dried or cooked before being eaten[51, 177].

The tubers are boiled and eaten in Nepal, mixed with lime juice (Citrus aurantifolia) or another sour substance[272]. The tubers are buried in masses in pits until acetous fermentation takes place, they are then dug up, washed and cooked, by which means their acrimonious principles are in part dispersed[2]. However, violent illness has still been known to follow a hearty meal of the tubers[2]. See also the notes above on toxicity.

tcanta InsecticideThe tubers have insecticidal properties[272].

dwatta VermifugeThe roots have been used as a vermifuge in cattle[240, 243]. The juice of the tubers is applied to the wounds of cattle in order to kill any parasites[272]. The dried powdered tubers is applied to snake bites[272]. The seeds have been mixed with salt and used to treat colic in sheep[240, 243, 272].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog garden, woodland garden or a sheltered border in semi-shade[134, 200]. Prefers a loamy or peaty soil and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too hot or exposed[1, 200]. Plants are not very hardy outdoors in Britain and are normally best if given protection[1]. However, they can succeed outdoors in the milder areas of the country if the tubers are planted about 20cm deep[200]. Plants require protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year. This species usually bears either monoecious or all male flowers[266].

### 7.2.253 Berberis empetrifolia

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjltunykfrip hpa7tli flatpriklwis hpa7tmwatli fyifkre7t hjonli

drutta Berberis empetrifolia is an evergreen Shrub growing to 0.3 m (1ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[2, 69, 105, 177]. The fruits are about 7mm long[200].

tcanta DyeA yellow dye is obtained from the root and bark.

dwatta Antibacterial Cancer DysenteryBerberine, universally present in rhizomes of Berberis species, has marked antibacterial effects. Since it is not appreciably absorbed by the body, it is used orally in the treatment of various enteric infections, especially bacterial dysentery[218]. It should not be used with Glycyrrhiza species (Licquorice) because this nullifies the effects of the berberine[218]. Berberine has also shown antitumour activity[218].

propta Seed - best sown as soon as it is ripe in a cold frame, when it should germinate in late winter or early spring[78]. Seed from over-ripe fruit will take longer to germinate[78], whilst stored seed may require cold stratification and should be sown in a cold frame as early in the year as possible[80]. The seedlings are subject to damping off, so should be kept well ventilated[113]. When the seedlings are large enough to handle, prick them out into individual pots and grow them on in a cold frame. If growth is sufficient, it can be possible to plant them out into their permanent positions in the autumn, but generally it is best to leave them in the cold frame for the winter and plant them out in late spring or early summer of the following year. Cuttings of

half-ripe wood, July/August in a frame[11, 113]. Pot up in the spring[113]. Cuttings of mature wood of the current season's growth, preferably with a heel, October/November in a frame[78].

nwatta Prefers a warm moist loamy soil and light shade but it is by no means fastidious, succeeding in thin, dry and shallow soils[11, 200]. Grows well in heavy clay soils. Plants are hardy to about -15°C[184]. Hybridizes freely with other members of this genus[1]. Plants can be pruned back quite severely, they resprout well from the base[200].

### 7.2.254 Vitis californica

California Grape, California wild grape
6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 9 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjltunyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Vitis californica is a deciduous Climber growing to 9 m (29ft 6in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw, cooked or dried for winter use[105, 161, 177, 257]. It can also be made into jellies, pies etc[183]. The fruit is quite juicy but is very small. The fruit is about 8mm in diameter[200], but it has a thin flesh and is of little value even in America for its fruit[11, 200]. Young leaves are wrapped around other foods and then baked, they impart a pleasant flavour. Young tendrils - raw or cooked. A pleasantly sour snack when eaten raw[183].

tcanta Basketry Dye StringA yellow dye is obtained from the fresh or dried leaves[168]. The roots have been used as a basketry material for basket bottoms[257]. Woody parts of the vines have been used for the rims of large cone-shaped carrying baskets[257]. Smaller vines have been twisted to make a strong rope[257].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe[K]. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Germination should take place in the first spring, but sometimes takes another 12 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in early summer. Cuttings of mature wood of the current seasons growth, December/January in a frame. These cuttings can be of wood 15 - 30cm long or they can be of short sections of the stem about 5cm long with just one bud at the top of the section. In this case a thin, narrow strip of the bark about 3cm long is removed from the bottom half of the side of the stem. This will encourage callusing and the formation of roots. Due to the size of these cuttings they need to be kept in a more protected environment than the longer cuttings. Layering.

nwatta Prefers a deep rich moist well-drained moderately fertile loam[1, 200]. Grows best in a calcareous soil[200]. Succeeds in sun or partial shade though a warm sunny position is required for the fruit to ripen[200]. The young growth in spring can be damaged by late frosts. Plants climb by means of tendrils[182]. Any pruning should be carried out in winter when the plants are dormant otherwise they bleed profusely[182, 200]. Plants in this genus are notably susceptible to honey fungus[200].

### 7.2.255 Adenophora verticillata

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjltut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Adenophora verticillata is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for:

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants can be killed by excessive winter wet[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.402 Sedum spurium

Caucasian Stonecrop
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjltunyk hpa7tli flatpriklwis hpa7tmwatli fyifkre7t hjonli

drutta Sedum spurium is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked. The leaves are thick and juicy but somewhat astringent and with a slight bitterness[K].

tcanta Can be used as a ground cover plant in a sunny position[197, 208]. It requires weeding for the first year or so[197].

dwatta None known

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. Tolerates poor soils. Hardy to about -5°C[200]. A mat-forming plant, it is very invasive[83]. The flowers of this species are white or pink[200]. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

### 7.2.403 Chamaedaphne calyculata

Leather Leaf

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Chamaedaphne calyculata is an evergreen Shrub growing to 0.8 m (2ft 7in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaAn aromatic tea-like beverage is brewed from the fresh or dried leaves[161,

177, 183, 257]. Some reports say that boiling or steeping can extract a harmful toxin 'andromedotoxin' and it is recommended that the leaves are put in a jar of water and left in a sunny position to brew in order to make 'sun-tea'[183].

tcanta None known

dwatta Antiphlogistic FebrifugeA poultice of the leaves has been applied to inflammations[257]. An infusion of the leaves has been used to treat fevers[257].

propta Seed - sow February in a lime-free compost in a greenhouse and only just cover the seed[78]. Do not allow the compost to dry out and keep the pot in a shady position. Germination is usually fair, taking 1 - 12 months at 15°C, though 4 weeks cold stratification may reduce this time[164]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts[164]. Cuttings of almost ripe side-shoots, 4 - 5cm long with a heel, August in a frame. A variable degree of success[78]. It can help to prune the plants lightly after flowering in order to encourage vigorous growth from which to take the cuttings[78]. Layering in August. Takes 18 months. High percentage[78].

nwatta Thrives in a moist well-drained lime-free soil in sun or semi-shade[1, 200]. Best if given some protection from the midday sun[1]. Plants are hardy to about - 25°C[184]. There are some named forms, selected for their ornamental value. 'Nana' is a dwarf compact form that is good for shady areas[183]. The flowers have a delicate refreshing scent[245].

### 7.2.404 Dracocephalum heterophyllum

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjltunyk hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Dracocephalum heterophyllum is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked[105, 177].

tcanta None known

dwatta None known

propta Seed - sow in an outdoor seedbed in April/May. The seed usually germinates in 1 - 4 weeks at 15°C[175]. If seed is in short supply then we would recommend sowing it in a pot in a cold frame, potting it up as soon as it is large enough to handle and growing it on in the frame for the first winter, planting out in late spring. Division in spring or autumn[200]. Basal cuttings in April/May[1, 200]. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Grows best in a sunny position in a fertile well-drained soil according to some reports[200, 245] whilst other reports say that it prefers a cool position and some shade[1, 175]. Prefers some shelter and a moist but not wet soil[175].

### 7.2.405 Cornus monbeigii

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjltunykfrip hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cornus monbeigii is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

plant, specimens can survive in the garden for at least 50 years[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1].

## 7.2.398 Ornithogalum narbonense

Star Of Bethlehem  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Ornithogalum narbonense is a BULB growing to 0.4 m (1ft 4in) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to June, and the seeds ripen from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb[46, 61, 177]. No further details are given, though it is probably cooked before being eaten. Some caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[200]. Sow the seed thinly and leave the seedlings undisturbed in the pots for their first dormancy, but apply liquid feed at intervals, especially in their second year of growth. Divide the bulbs at the end of their second year of growth, putting 2 - 3 bulbs in each pot. Grow them on for one more year and then plant them out into their permanent positions whilst they are dormant. The seed can also be sown in a cold frame in early spring. Division of offsets in September/October[200]. The larger bulbs can be replanted immediately into their permanent positions. It is best to pot up the smaller bulbs and grow them on for a year before planting them out when dormant in late summer.

nwatta An easily grown plant[90], it succeeds in any position[42] in ordinary garden soil[1]. Prefers a sunny position[200]. Succeeds in short grass[90], though this should not be mown from the time the bulbs start to grow until they have set seed and the leaves are dying down. Plants are hardy to about -10°C[200].

## 7.2.399 Goodyera oblongifolia

Western Rattlesnake Plantain  
6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Goodyera oblongifolia is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: GumAn exudation from the plant is used as a chewing gum[105, 161, 177].

tcanta GumNone known  
dwatta Poulitice TonicAn infusion of the plants has been used as a tonic[257]. A poultice of the softened leaves has been applied to cuts and sores[257]. An infusion of the leaves has been used in the bath water for treating stiff muscles[257].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon

a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. Division is best carried out in the spring[230]. Each division should have a leading point and two, or preferably three, joints of the rhizome[230]. More propagating material can be obtained by cutting halfway through the rhizome during the previous growing season at the point where you wish to divide[230]. This will stimulate the production of growth buds at the point of division[230].

nwatta Requires a somewhat shady site and a well-drained compost of peat, leafmold and sand[1]. Does well in the woodland garden[42, 230]. This species is not very hardy in Britain, it is suitable for cultivation in a cool greenhouse or, perhaps, for a select position outdoors[1]. It is closely related to the British native species *G. repens*[230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230].

## 7.2.400 Amsinckia lycopsoides

Tarweed Fiddleneck  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Amsinckia lycopsoides is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Fresh juicy shoots[161, 177, 257]. No more details are given. Seed - raw[257]. The parched seed is ground into a powder then made into cakes and eaten without being cooked[257]. If this species is like most other members of the family Boraginaceae, the seed is likely to ripen over a period of time and individual seeds fall from the plant when they are ripe. This will make harvesting any quantity of seed very fiddly and time consuming[K].

tcanta None known  
dwatta None known  
propta Seed - sow late spring in situ[200].  
nwatta Succeeds in ordinary garden soil in full sun[1, 200].

## 7.2.401 Salvia lanata

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Salvia lanata is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: StemEdible Uses: Stems are peeled and eaten[2, 177].

tcanta None known  
dwatta Astringent Dysentery Emetic PouliticeThe roots are used in the treatment of colds and coughs[240]. The seed is emetic[240]. It is used in the treatment of dysentery, haemorrhoids, colic and, externally, boils[240]. A poultice of the leaves is used as a dressing for wounds and is also applied to itchy skin[240].

light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Root - raw or cooked[46, 61, 105, 177]. A sweet taste[74]. Leaves-cooked[105, 177].

tcanta None known  
dwatta Antidote Antifungal Cardiotoxic Expectorant Febrifuge Sialagogue Stomachic Women's complaintsThis is a commonly used medicinal plant in China. The root is antidote, antifungal, cardiotoxic, expectorant, febrifuge, expectorant, sialagogue, stomachic and tonic[176, 218]. It is used in the treatment of women's diseases, chronic bronchitis with dry cough, pulmonary infections with cough and thick yellow sputum, dry throat[218].

propta Seed - best sown in a cold frame as soon as it is ripe[200]. The seed can also be sown in spring. Surface sow 2 - 3 seeds per pot in the spring in order to avoid transplanting[133]. We have found that if transplanted when very small seedlings grow away without difficulty[K]. Germinates in 1 - 3 months at 10°C[133]. Plant out into their permanent positions whilst young. Basal cuttings in spring[K]. Division in spring - very difficult because the plant dislikes root disturbance[1].

nwatta Prefers a light rich slightly alkaline soil that is not too dry, and a warm sunny position[1, 200]. Grows well in the semi-shade of shrubs or in light woodland[88]. Plants are intolerant of root disturbance[1]. The young growth is extremely attractive to slugs, they have been known to destroy even mature plants[K].

## 7.2.256 Cuphea viscosissima

Tarweed, Blue waxweed  
6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Cuphea viscosissima is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta The plant has potential as an oil seed crop (World Economic Plants)

tcanta None known  
dwatta None known  
propta Seed - this can be sown in a greenhouse in early spring, putting the young plants out in late spring after the last expected frosts. Seed can also be sown outdoors in situ in mid to late spring.

nwatta Succeeds in any reasonably fertile soil in full sun or part shade[200].

## 7.2.257 Acer distylum

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwis hpa7tmwatli hjonli

drutta Acer distylum is a deciduous Tree growing to 15 m (49ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SapEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[105, 177, 183]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (*A. saccharum*). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta PreservativeThe leaves are packed around apples, root crops etc to help preserve them[18, 20].

dwatta None known  
propta Seed of plants grown in gardens can be relied upon to breed true. It is best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°C. It can be slow to germinate. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. Layering, which takes about 12 months, is successful with most species in this genus. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. This species is quite difficult to grow away well from cuttings.

nwatta Of easy cultivation, it prefers a good moist well-drained soil[11], preferring a sunny position but tolerating some shade[11, 200]. Grows well in heavy clay soils. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Plants are usually monoecious, but hermaphrodite forms occur[275].

## 7.2.258 Celtis tournefortii

Ornital hackberry  
6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 8 m hkuc  
htut cyutli hgatkuyuctup hwicli hyishrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Celtis tournefortii is a deciduous Tree growing to 8 m (26ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in April, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 177]. Small[183]. We have no further information, but the fruit is liable to consist of a thin, sweet, though dry and mealy flesh around a large seed[K].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in a cold frame[200]. Stored seed is best given 2 - 3 months cold stratification and then sown February/March in a greenhouse[78, 200]. Germination rates are usually good, though the stored seed might take 12 months or more to germinate. The seed can be stored for up to 5 years[113]. As soon as they are large enough to handle, prick the seedlings out into individual pots. The leaves of seedlings often have a lot of white patches without chlorophyll, this is normal and older plants produce normal green leaves. Grow the seedlings on in a cold frame for their first winter, and plant them out in the following late spring or early summer[K]. Give them some protection from the cold for their first winter outdoors. Cuttings

nwatta Succeeds in any reasonably good soil, preferring a good fertile well-drained loamy soil[1, 11, 200]. Succeeds on dry gravels and on sandy soils[200]. Established plants are very drought resistant[200]. Trees prefer hotter summers and more sunlight than are normally experienced in Britain, they often do not fully ripen their wood when growing in this country and they are then very subject to die-back in winter[1, 11, 200]. Trees can be very long-lived, perhaps to 1000 years[200]. This tree is more likely to thrive in Britain than most species in the genus[200]. This species is closely

related to *C. glabrata*[11]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.259 Brassica rapa dichotoma

Indian Rape

6 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 0.9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta *Brassica rapa dichotoma* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Leaves - raw or cooked. A bit on the coarse side, though the young leaves can be added in moderation to salads whilst older leaves make an acceptable vegetable[K]. An edible oil is obtained from the seeds.

tcanta None known  
dwatta None known  
propta Seed - sow in situ in the spring.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Prefers a light sandy soil and dislikes a heavy soil[37]. Prefers cool moist growing conditions[16]. Succeeds in any reasonable soil. Tolerates a pH in the range 4.3 to 8.3. Indian rape is cultivated mainly in India and Nepal for its oil-rich seeds.

## 7.2.260 Yucca gloriosa

Spanish Dagger, moundlily yucca, Palm Lily, Roman Candle, Mound Lily Yucca, Spanish Dagger  
6 tlin 11 cyuc 2 kcaok 0 tcan 1 dwat 1.8 m hkuc hmimhtut cyutli hgatkyuctup hwicli hyishrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Yucca gloriosa* is an evergreen Shrub growing to 1.8 m (6ft) by 1.2 m (4ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Hand. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Flowers Fruit Root StemEdible Uses: Fruit - raw or cooked. The fruit is up to 10cm long and 26mm wide[229]. The fruit is very rarely produced in the wild[82]. Flowers - raw or cooked. They are delicious raw, and can also be dried, crushed and used as a flavouring[164]. Flowering stem - cooked and used like asparagus[164]. Root - cooked. It can be dried, ground into a powder and made into a bread[105].

tcanta Fibre SoapA fibre obtained from the leaves is used for making cloth, ropes, baskets and mats[46, 61, 82, 169]. The roots are rich in saponins and can be used as a soap substitute[82].

dwatta Detergent PurgativeThe fruit is purgative[240]. The root is detergent[240].

propta Seed - sow spring in a greenhouse. Pre-soaking the seed for 24 hours in warm water may reduce the germination time. It usually germinates within 1 - 12 months if kept at a temperature of 20°C. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for at least their first two winters. Plant them out into their permanent positions in early summer and consider giving them some winter protection for at least their first winter outdoors - a simple pane of glass is usually sufficient[K]. Seed is not produced in Britain unless the flowers are hand pollinated. Root cuttings in late winter or early spring. Lift in April/May and remove small buds from base of stem and rhizomes. Dip in dry wood ashes to stop any bleeding and plant in a sandy soil in pots

in a greenhouse until established[78]. Cuttings can be made of the tops of old plants. These normally root quite easily in the growing season[11].

nwatta Agroforestry Services: Living fence Industrial Crop: Fiber Management: Standard Regional CropLandscape Uses:Massing, Specimen. Thrives in any soil but prefers a sandy loam and full exposure to the south[11]. Plants are harder when grown on poor sandy soils[200]. Established plants are very drought resistant[190]. Judging by its native habitat, this plant should tolerate maritime exposure[K]. Very cold hardy, tolerating temperatures down to at least -15°C[200], or to -25°C according to another report[187], but plants are subject to injury and decay by winter damp and snow[11]. A very ornamental plant[1], there are some named varieties[187]. Plants do not flower every year, requiring hot summers to initiate flowering[190]. The flowers are produced in the autumn and are often damaged by early frosts[233]. The scent of the flowers is most pronounced at night[245]. In the plants native environment, its flowers can only be pollinated by a certain species of moth. This moth cannot live in Britain and, if fruit and seed is required, hand pollination is necessary. This can be quite easily and successfully done using something like a small paint brush. Individual crowns are monocarpic, dying after flowering[233]. However, the crown will usually produce a number of sideshoots before it dies and these will grow on to flower in later years[233]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus seem to be immune to the predations of rabbits[233]. Special Features:North American native, Attracts butterflies, Fragrant flowers, Blooms are very showy.

## 7.2.261 Pinus culminicola

Cerro Potosi Pinyon

6 tlin 9 cyuc 2 kcaok 0 tcan 2 dwat 5 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta *Pinus culminicola* is an evergreen Tree growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: SeedEdible Uses: CondimentSeed-raw or cooked[81]. The oil-rich seed has a resinous flavour. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

tcanta Dye Herbicide WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc.

dwatta The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils

stratification at between 0 and 5°C and should be sown as early in the year as possible[113, 164]. Under normal storage conditions the seed can remain viable for 17 years or more. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter, planting them out in late spring of the following year. Cuttings of half-ripe wood, 10 - 15cm with a heel, July/August in a frame[78, 113]. Cuttings of mature wood of the current year's growth, preferably with a heel of the previous year's growth, November to February in a cold frame or sheltered bed outdoors[78, 200].

nwatta Easily grown in a moisture retentive but well-drained loamy soil of at least moderate quality[11, 200]. Requires a sunny position[11]. Hardy to about -20°C[200]. A very ornamental plant[60], it is closely related to *R. menziesii*[1]. Plants can harbour a stage of 'white pine blister rust', so they should not be grown in the vicinity of pine trees[155]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.395 Artemisia indica

6 tlin 9 cyuc 1 kcaok 0 tcan 3 dwat 1.2 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Artemisia indica* is a ANNUAL/PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: LeavesEdible Uses: Colouring CondimentYoung leaves - cooked and eaten with barley[183]. The leaves are also pounded with steamed glutinous rice to give a flavour and colouring[177, 183].

tcanta Essential InsecticideThe plant yields about 0.2% essential oil. This is a good larvicide and a feeble insecticide[240]. The dried leaves and flowers are used as an incense[272].

dwatta Anthelmintic Antiseptic Antispasmodic Dysentery Emmenagogue Expectorant Ophthalmic Stomachic TonicThe leaves and flowering stems are anthelmintic, antiseptic, antispasmodic, emmenagogue, expectorant and stomachic[240, 272]. An infusion is used in the treatment of nervous and spasmodic affections, in asthma and in diseases of the brain[240, 272]. This infusion is also considered to be helpful in improving the appetite[272]. The juice of the plant is used in Nepal to treat diarrhoea, dysentery and abdominal pains[272]. It is used as an eyewash where it is said to relieve the burning sensation in conjunctivitis[272]. A paste of the plant is applied externally to treat wounds[272]. The roots are antiseptic and are a tonic for the kidneys[240, 266, 272].

propta Seed - surface sow spring in a greenhouse. Do not allow the compost to dry out. When large enough to handle, prick the seedlings out into individual pots and plant them out in early summer. The seed can also be sown in situ in late spring.

nwatta Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Plants are annuals or short-lived perennials[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.396 Bromus rigidus

Rippgut Brome

6 tlin 9 cyuc 1 kcaok 0 tcan 0 dwat 1 m hkuc htut cyutli hgatkyuctup hwicli hyishrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta *Bromus rigidus* is a ANNUAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Cleistogomy (self-pollinating without flow-

ers ever opening). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed[161, 177]. Used as a piñole, or dried then ground into a powder and mixed with water to make a gruel[257]. The seed is small and would be rather fiddly to use[K].

tcanta None known  
dwatta None known  
propta Seed - sow spring or autumn in situ and only just cover. Germination should take place within 2 weeks.

nwatta Succeeds in ordinary well-drained garden soil in a sunny position[138, 200]. The plant has cleistogamous flowers, these flowers do not open but produce seed by means of self-fertilization.

## 7.2.397 Paeonia japonica

Yama-Shakuyaku

6 tlin 9 cyuc 1 kcaok 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta *Paeonia japonica* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers Leaves RootEdible Uses: Flowers[177]. No further details are given. Young leaves - cooked[177].

tcanta None known  
dwatta Analgesic Antibacterial Antiinflammatory Antispasmodic Diuretic Febrifuge SedativeThe root is analgesic, antibacterial, anti-inflammatory, antispasmodic, diuretic, febrifuge and sedative[174]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1, 200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Closely related to *P. obovata*, this species is not easily cultivated in Britain and tends to be a poor doer here[200]. Plants offered under this name in British nurseries are often *P. suffruticosa* 'Japanese'[200]. Some botanists now treat this plant as no more than a form of *P. lactiflora*[250]. A very long-lived

disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K].

**nwatta** Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -15°c[250], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. This species is not recognised by some Chinese botanists, who hold that it is no more than a form of *P. delavayi*[214]. A very ornamental plant[1]. It grows best in areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants come into growth early in the year and are then subject to damage by late frosts, they are therefore best sited in a position that is shaded from the morning sun[11]. The branches are brittle and very subject to wind damage, especially when young[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. The plant does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. This species strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Cultivated in China as a medicinal plant[214].

## 7.2.393 Paeonia szechuanica

Tree Peony  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc  
hmmhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprik-  
wissip hpa7tmwatli fyfxfre7t hjonli

**drutta** *Paeonia szechuanica* is a deciduous Shrub growing to 1.5 m (5ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**ckakta** Edible Parts: FlowersEdible Uses: The following use is for *P. suffruticosa*. It quite probably also applies to this closely-related species.[K - see 214]. Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or cooked in various dishes[183].

**tcanta** None known

**dwatta** Analgesic Antibacterial Antinflammatory Antispasmodic tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250]. The following uses are for *P. suffruticosa*. They quite probably also apply to this closely-related species.[K - see 214]. The root and root bark is analgesic, antibacterial, anti-inflammatory, antipyretic, antispasmodic, emmenagogue, sedative, styptic and tonic[46, 61, 174, 176, 178, 218]. An extract of the plant has antibacterial activity[218]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastro-intestinal infections[238]. This remedy should only be used under the

supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (*Glycyrrhiza* spp)[218].

**propta** Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K].

**nwatta** Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -20°c[184], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. A very ornamental plant[1]. It grows best in areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants come into growth early in the year and are then subject to damage by late frosts, it is therefore best to site them in a position with shade from the early morning sun[11]. The branches are brittle and very subject to wind damage, especially when young[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. The plant does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Cultivated in China as a medicinal plant[214].

## 7.2.394 Ribes lobbii

Gummy Gooseberry

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 1.8 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

**drutta** *Ribes lobbii* is a deciduous Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**ckakta** Edible Parts: FruitEdible Uses: Fruit - raw or cooked[101, 105, 161, 257]. Generally considered to be unpalatable, but they were occasionally eaten by some native North American Indian tribes[256].

**tcanta** Needles StringThe roots have been boiled with cedar (*Juniperus* spp, *Thuja* sp.) and wild rose (*Rosa* spp) roots, then pounded and woven into rope[257]. The sharp thorns have been used as probes for boils, for removing splinters and for tattooing[257].

**dwatta** Astringent Poultice SalveThe root has been used in the treatment of diarrhoea[257]. A poultice of the roots and salt water has been applied to mouth sores, body sores, blisters and carbuncles[257]. The root ash, mixed with oil, has been used as a salve on boils[257].

**propta** Seed - best sown as soon as it is ripe in the autumn in a cold frame. Stored seed requires 3 months cold

etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

**propta** It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°c can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

**nwatta** Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought, succeeding in hot dry positions[200]. A slow growing plant[81], but when mature it is fully hardy in Britain[200]. Young trees are less hardy than mature specimens, only tolerating temperatures down to about -3°c[260]. Plants are often sub-dioecious[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. The cones open and shed their seed whilst still attached to the tree[226]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.262 Pinus ayacahuite

Mexican White Pine

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 55 m hkuc  
htut cyutli hgaktyucutp hwicli hyishrasljut hpa7tli flatprik  
hpa7tmwatli dyat hjonli

**drutta** *Pinus ayacahuite* is an evergreen Tree growing to 55 m (180ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**ckakta** Edible Parts: SeedEdible Uses: CondimentSeed-raw or cooked[183]. The seed is about 8mm long[200]. Rich in oil, the seed has a resinous flavour. A vanillin flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

**tcanta** Dye Herbicide Resin WoodA tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc.

**dwatta** The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and

as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

**propta** It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°c can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

**nwatta** Thrives in a light well-drained sandy or gravelly loam[1]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. Growth of older trees tends to be very slow but many younger trees are growing fairly quickly averaging more than 30cm a year[185]. This tree is unique in being the only tree from the tropics (it is found between latitudes 14 and 20°north) to succeed in central Scotland, latitude 57°north[200]. It tolerates temperatures down to about -15°c[260]. The cones open and shed their seed whilst still attached to the tree[226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Seed cones are up to 30cm long[200]. A tree at Kew in January 1995 was about 12 metres tall and had well over 50 large cones on it. Another mature tree of the same species growing nearby had only a very few cones[K]. Leaf secretions inhibit the germination of seeds, thereby inhibiting the growth of other plants below the tree[18]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.263 Juniperus rigida

Temple Juniper, Needle Juniper

6 tlin 7 cyuc 2 kcaak 0 tcan 1 dwat 8 m hkuc  
htut cyutli hgaktyucutp hwicli hrasljutnyik hpa7tli flatprik-  
lwissip hpa7tmwatli nyanhjen hjonli

**drutta** *Juniperus rigida* is an evergreen Tree growing to 8 m (26ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**ckakta** Edible Parts: Fruit OilEdible Uses: Condiment OilFruit - raw or cooked[183]. It can also be ground into a powder and used as a spice[105, 177, 183]. The cones are about 7 - 11mm in diameter, they take 2 years to mature[200].

**tcanta** Oil WoodAn oil is obtained from the fruit. It is mentioned as being diuretic[61], is this an essential oil? Wood. Used for construction, agricultural implements, fencing etc[61].

**dwatta** DiureticThe fruit is diuretic[61, 254].

**propta** The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may

speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Laying in September/October. Takes 12 months[78].

nwatta Landscape Uses:Screen, Specimen. Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1] and succeeding on chalk[200]. Established plants are drought tolerant, succeeding in hot dry positions[200]. A very ornamental plant[1], it thrives in S. England[11]. Trees are very slow growing in Britain, normally averaging only 15cm a year increase in height[185]. Cultivated for its wood in Asia[61]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Fragrant foliage, Inconspicuous flowers or blooms.

### 7.2.264 Ophrys araneola

6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Ophrys araneola is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the

old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

### 7.2.265 Chusquea culeou

Culeu

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 5 m hkuc hmim cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Chusquea culeou is an evergreen Bamboo growing to 5 m (16ft) by 2.5 m (8ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcaakta Edible Parts: StemEdible Uses: Young shoots - cooked[25, 177].

tcanta Musical WoodThe canes are used in making musical instruments, plain furniture and fencing[139].

dwatta None known

propta Seed - surface sow as soon as it is ripe in a greenhouse at about 20°C. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3- 6 months. Grow on in a lightly shaded place in the greenhouse until large enough to plant out. Seed is rarely available. Division in spring as new growth commences. Very difficult[200]. Take divisions with at least four canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200]. Basal cane cuttings.

nwatta Prefers a damp humus rich soil[200]. Prefers an open loam of reasonable quality, doing well on peat[11]. Likes plenty of moisture in the growing season[11]. Established plants are drought tolerant[25, 162, 195]. They require a position sheltered from cold north and east winds[11, 200]. A very hardy plant[25, 162], tolerating temperatures down to about -15°C[200]. Another report says that the plant is probably only hardy in the milder areas of the country[1]. It succeeds outdoors at Edinburgh Botanical Gardens[195] and is growing well at Kew[K]. This species is found further south in the world than any other species of bamboo, it grows in Chile as far south as latitude 47°south[195]. The rootstock is caespitose, new shoots are produced from late April and can grow 15cm overnight[25]. Plants take 2 - 3 years to settle down after being moved but are then quite fast growing[162]. Another report says that they are slow growing[188]. This species is notably resistant to honey fungus[200]. Plants flower and produce seed annually in the wild without dying as a result of the flowering[162]. Plants of the cultivar 'Tenius' have been observed to be flowering in

dwatta Anodyne Antibacterial Anticoagulant Antifungal Antiinflammatory Antiphlogistic Antirheumatic Antispasmodic Antitumor Epilepsy Expectorant Sedative Stomachic-Tian Nan Xing has been used in Chinese herbal medicine for thousands of years and is valued especially for its beneficial affect upon the chest[254]. When prescribed internally it is always used dried and in conjunction with fresh ginger root[254]. The root is an acrid irritant herb that is anodyne, antibacterial, antifungal, antiphlogistic, antirheumatic, anticancer, antispasmodic, antitumor, expectorant, sedative and stomachic[147, 176, 218, 238]. The dried root is used internally in the treatment of coughs with profuse phlegm, tumours, cervical cancer, epilepsy, tetanus and complaints involving muscular spasms[176, 238]. The fresh root is applied externally as a poultice to ulcers and other skin complaints[254]. The root is harvested when the plant is dormant in the autumn or winter and is dried for later use[238]. The whole plant is anticoagulant, anti-inflammatory, anti-spasmodic and anodyne[218].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool peaty soil in the bog, woodland garden or a sheltered border in semi-shade[200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. This species requires a warm corner in British gardens[233]. Plants are nearly hardy in Britain, they normally succeed outdoors in the milder areas of the country[1]. They tolerate temperatures down to about -10°C[90], though the young growth can be damaged by spring frosts[238]. Tubers should be planted about 10cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

### 7.2.390 Geranium nepalense

Nepalese Crane's Bill

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlis hpa7tmwatli xre7t hjonli

drutta Geranium nepalense is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Leaves[179]. No further details are given. Fruits - chewed fresh[272]. The fruit is a small dry capsule[K].

tcanta Dye TanninA red dye is obtained from the root, it is similar to Rubia cordifolia[61]. The root contains 25 - 32% tannins[272].

dwatta Antibacterial AstringentThe whole plant is antibacterial and astringent[145, 174, 218]. It is prescribed in the treatment of nervous diseases, numbness of the limbs, pains, rheumatism, renal diseases etc[218, 240]. The juice of the plant is valued in treating renal diseases[272].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil

types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 7.2.391 Dracocephalum parviflorum

American Dragonhead

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwlissip hpa7tmwatli xre7t hjonli

drutta Dracocephalum parviflorum is a ANNUAL/BIENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: SeedEdible Uses: CondimentSeed[105, 161, 177, 257]. No more details. The leaves have been used as a flavouring[257].

tcanta None known

dwatta Febrifuge OphthalmicThe plant has been used to treat diarrhoea in children[257]. The leaves are febrifuge and ophthalmic[257]. A cold compound infusion has been used in the treatment of fevers and headaches[257]. Externally, it has been used as an eyewash[257].

propta Seed - sow early spring in situ. Pinch back the shoot tips in May in order to encourage bushy growth[200].

nwatta Succeeds in a sunny position in a fertile well-drained soil[200]. The plant is very fragrant[200]. It is useful for filling gaps in the summer border[200].

### 7.2.392 Paeonia lutea

Tree Peony, Dian mu dan

6 tin 9 cyuc 1 kcaak 0 tcan 3 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatprikwlissip hpa7tmwatli fyfxfre7t hjonli

drutta Paeonia lutea is a deciduous Shrub growing to 1.5 m (5ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FlowersEdible Uses: The following use is for *P. suffruticosa*. It quite probably also applies to this closely-related species.[K - see 214]. Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or cooked in various dishes[183].

tcanta None known

dwatta Analgesic Antibacterial Antiinflammatory Antispasmodic Cholera DysenteryThe bark obtained from the root has an antimicrobial effect upon various bacteria, including Escherichia coli, typhoid, cholera, Staphylococcus aureus, streptococcus hemolyticus and Pneumococci[250]. The root is also anti-inflammatory and has been used with success in the treatment of arthritic joint swelling[250]. The root is also analgesic, sedative and anticonvulsant, it has a high success rate in the treatment of dysentery and can also be used to treat allergic rhinitis[250]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastro-intestinal infections[238]. This remedy should only be used under the supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (Glycyrrhiza spp)[218]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to



is chiefly used to lower blood pressure and heart rate, ease anxiety and promote sleep. In low doses it can also relieve panic attacks and headaches, and also improves the ability to concentrate[254]. The plant's efficacy as an anticancer treatment has been subject to a significant amount of research - there is no doubt that certain constituents of the plant, especially the viscotoxins, exhibit an anticancer activity but the value of the whole plant in cancer treatment is not fully accepted[254]. It is said that the constituents of mistletoe vary according to the host plant it is growing on - that found on oak trees is said to be superior[238]. Because of the potential side effects, this plant should only be used internally under the guidance of a skilled practitioner. Using the plant internally can provoke intolerant reactions to certain substances[7]. The leaves and young twigs contain several medically active compounds[279]. They are antispasmodic, cardiac, cytotostatic, diuretic, hypotensive, narcotic, nervine, stimulant, tonic and vasodilator[4, 7, 19, 21, 46, 66, 165, 238, 279]. They are harvested just before the berries form and are dried for later use[4]. Mistletoe has a reputation for curing epilepsy and other convulsive nervous disorders[4]. The effect of the correct dosage is to lessen and temporarily numb the nervous activity that causes the spasms, but larger doses can produce the problem[4]. Mistletoe has also been employed in checking internal haemorrhages, in treating high blood pressure and in treating cancer of the stomach, lungs and ovaries[4, 9, 238, 279]. Externally, the plant has been used to treat arthritis, rheumatism, chilblains, leg ulcers and varicose veins[238]. A homeopathic remedy is made from equal quantities of the berries and leaves[4]. It is difficult to make because of the viscosity of the sap[4]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Viscum album* Mistletoe for rheumatism, tremor therapy as an adjuvant (see [302] for critics of commission E).

propta This is a parasitic plant that grows entirely on the host tree. To grow it you need to obtain berries and squash them onto the branches of host trees in late autumn and early winter[11]. This is best done on the lower side of the branch[1]. It is then simply a matter of waiting and hoping.

nwatta A parasitic plant, growing on the branches of several deciduous species of trees. It is not usually found on coniferous trees, though the subspecies *V. album abietis* is found on conifers, especially *Abies* spp, whilst *V. album austriacum* is found on pine and larch. The host tree must be at least 20 years old[200]. Although the host branch might eventually succumb, the host tree is seldom killed[200].

## 7.2.387 Vaccinium bracteatum

Sea Bilberry  
6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Vaccinium bracteatum* is an evergreen Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177, 183]. The fruit is about 6mm in diameter[200].

tcanta None known

dwatta CancerThe plant has been used in the treatment of cancer[218].

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5-8cm with a heel, August in a frame[78]. Slow and difficult. Layering in

late summer or early autumn[78]. Another report says that spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Plants are hardy at Kew but they are better grown in milder areas[11]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. Closely related to *V. sprengelii*[182]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.388 Eupatorium chinense

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Eupatorium chinense* is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: CondimentThe young leaves are used as a flavouring[177].

tcanta The powdered plant is used in Nepal to prepare *marcha*, a fermenting cake from which liquor is distilled[272].

dwatta Anodyne Carminative Diuretic Nervine Vermifuge Women's complaintsThe leaves are anodyne, carminative, diuretic, nervine and vermifuge[218]. An infusion is used in the treatment of colds, diphtheria and rheumatoid arthritis[238]. The leaves and stems are harvested in the summer before the flower buds open, and are dried for later use[238]. The seed is prescribed in China for the '36 diseases of women' [218]. The root is considered to be beneficial to the circulation and a restorative to women after parturition[218]. The roots are harvested in the autumn and dried for later use[238]. The milky latex is applied to treat *goitre*[272].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Succeeds in ordinary well-drained but moisture retentive garden soil in sun or part shade[200]. Plants seem to be immune to the predations of rabbits[233]. A polymorphic species[58].

## 7.2.389 Arisaema consanguineum

Tian Nan Xing  
6 tin 9 cyuc 1 kcaak 0 tcan 3 dwat 1 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Arisaema consanguineum* is a PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - boiled and used as a vegetable[272]. Some caution is advised, see the notes above on toxicity.

tcanta None known

1994, this is the first record of this species flowering in the northern hemisphere[214].

## 7.2.266 Petasites frigidus

Sweet Coltsfoot, Alrctic sweet coltsfoot, Arrowleaf sweet coltsfoot, Golden Palmc Sweet coltsfoot, Butterb  
6 tin 10 cyuc 2 kcaak 0 tcan 1 dwat 0.2 m hkuc  
pcimhmimhtut cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Petasites frigidus* is a PERENNIAL growing to 0.2 m (0ft 8in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from April to May, and the seeds ripen from May to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: Flowers Leaves Root StemEdible Uses: SaltYoung leaves - raw or cooked[46, 61, 257]. They are mixed with other greens and used as a potherb[183, 257]. The leaves can also be made into a sauerkraut[257]. Young stalks and flower heads - cooked[183]. Roots - cooked[172, 183]. The burnt leaves are used as a salt substitute[172]. The stems and leaves, whilst still green, are rolled up into balls, dried and then placed on top of a very small fire on a rock and burned[207]. A very acceptable condiment for pineole[207].

tcanta Containers StuffingA good ground cover for the wilder areas of the garden[200]. The cotton-like seed heads have been used as a stuffing material for mattresses[257]. The leaves have sometimes been folded into conical containers for collecting fruit[257]. They have also been used to make a temporary funnel[257].

dwatta Antispasmodic Pectoral PouliticeAntispasmodic, poulitice[172]. An infusion of the dried leaves has been used in the treatment of colds, head and chest congestion[257].

propta Seed - we have no information on this species but suggest sowing the seed in a cold frame as soon as it is ripe or in early spring. Only just cover the seed and do not allow the compost to dry out. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division succeeds at almost any time of the year. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Seashore, Woodland garden. Succeeds in ordinary garden soil[1], but prefers a deep fertile humus-rich soil that is permanently moist but not stagnant, succeeding in shade, semi-shade or full sun[200]. Prefers partial shade[31]. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. A very invasive plant, too rampant for anything other than the wild garden[187, 200]. Dioecious, male and female plants must be grown if seed is required. Special Features:Attractive foliage, North American native, Invasive, Wetlands plant.

## 7.2.267 Solidago missouriensis

Prairie Goldenrod, Missouri goldenrod, Tolmie's goldenrod  
6 tin 9 cyuc 2 kcaak 1 tcan 1 dwat m hkuc  
hmimhtut cyutli kyucutcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Solidago missouriensis* is a PERENNIAL growing to 1.2 m (4ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - raw or cooked[94, 155, 161]. They can be added to salads or used as a potherb[183]. A very good tea is made from the dried leaves and dried fully expanded flowers[183].

tcanta DyeMustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta AntisepticAntiseptic. An infusion of the dried powdered herb can be used[168].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.268 Gymnadenia conopsea

Fragrant Orchid  
6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Gymnadenia conopsea* is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Moths. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Bulb - cooked. Very nutritious[4, 46, 61]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a flour[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the

seedlings to grow on until they are large enough to move. Division in autumn. The plant is very intolerant of root disturbance, any moving or dividing should be attempted in the autumn, keep a large ball of soil around the plant[1]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Very easily grown in any good moist soil[42]. Requires a deep rich soil[1]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. A polymorphic species[17], it also hybridizes readily with other members of the genus[230]. The flowers have a delicious perfume which is more pronounced at night in order to attract Night Hawk-moths for pollination[245]. The sub-species *G. conopsea densiflora* has larger, more strongly scented flowers[245]. This species is a colonizer of disturbed ground and bare soils, new colonies can spring up many kilometres from the plants nearest known locality[230]. They have been known to colonize sites such as waste heaps of clinker at power stations[230]. Plants are very impatient of root disturbance[1].

## 7.2.269 Carduus nutans

Musk Thistle, Nodding plumeless thistle  
6 tin 9 cyuc 2 kcaak 3 tcan 2 dwat 0.9 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Carduus nutans* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Oil StemEdible Uses: Curdling agent OilPith of stem - boiled[61]. A pleasant taste[105], it is eaten like asparagus[177]. Said to be delicious[183]. The dried flowers are used as a curdling agent for plant milks etc[61, 183].

tcanta Oil PaperThe down of the plant is used to make paper[4]. The seed of all species of thistles yields a good oil by expression[4]. This species contains 41 - 44% oil[240]. The plant is very attractive to bees, hoverflies and butterflies[13, 245], it is a food plant for the caterpillars of many lepidoptera species[30]. Dynamic accumulator.

dwatta Blood purifier FebrifugeThe flowers are febrifuge and are used to purify the blood[145, 240]. The seeds contain a fixed oil that is rich in linoleic acid[240]. This has proved of benefit in the prevention of atherosclerosis[240].

propta Seed - sow spring in situ.

nwatta Succeeds in a sunny position in ordinary garden soil[1, 200]. The flowers, and indeed the whole plant, give off a pleasing musk-like perfume[245].

## 7.2.270 Ophrys fusca

Brown Bee Orchid  
6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.4 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ophrys fusca* is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root - cooked. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[200]. Salep is said to be very nutritious and is made into a drink or added to other cereals and used in bread etc[183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115]. The salep can also be made into a drink[100].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move. This species only rarely forms new offsets and so division is seldom feasible, the following methods can be tried, however[230]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Plants can be grown in a lawn, but the lawn must not be cut until the plants have set seed[200]. Plants are best grown in the shade[188]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This symbiotic relationship makes them very difficult to cultivate, though they will sometimes appear uninvited in a garden and will then thrive. Transplanting can damage the relationship and plants might also thrive for a few years and then disappear, suggesting that they might be short-lived perennials[230]. The flowers resemble a female insect and also emit a scent similar to female pheromones, they are pollinated by a male insect of that species attempting to copulate with the flower[200]. Tubers should be planted out whilst they are dormant, this is probably best done in the autumn[200]. They should be planted at least 5cm below soil level[200].

tall. Cuttings of half-ripe wood in summer[200]. Grow on in cool, shaded humid conditions until well rooted[200].

nwatta Prefers a well-drained humus rich soil in partial shade in a position sheltered from cold drying winds[200]. We are not sure if this plant is hardy outdoors in Britain. One report says that it is hardy in zone 7 (tolerating temperatures down to between -10 and -15°C) but then goes on to suggest that it is best grown in pots or tubs outdoors and moved into a cold greenhouse in the winter[200]. There are some named varieties, selected for their ornamental value[200]. The plant has creeping rhizomes[266]. There has been some confusion between this species and *A. crenata*, the name *Ardisia cripisa* was misapplied by de Candolle to *Ardisia crenata*[266].

## 7.2.383 Cucubalus baccifer

Berry-Bearing Catchfly

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 1 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Cucubalus baccifer* is a ANNUAL growing to 1 cm (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants - cooked[177, 179].

tcanta TanninThe plant is rich in tannin[179].

dwatta StypticA decoction of the plant is used in the treatment of haemorrhages[218, 240].

propta Seed - sow spring in situ.

nwatta See the plants native habitat for ideas on its cultivation needs. Plants are hardy to between -10 and -15°C[200].

## 7.2.384 Scirpus cyperinus

Woolly Grass Bulrush, Woolgrass

6 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Scirpus cyperinus* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. Used as a rice substitute[178].

tcanta Stuffing WeavingThe stems are woven to make matting and ropes[178]. The small rushes have been used in making woven mats and storage bags[257]. The fruiting tops of the plant have been used as a resilient material for stuffing and making pillows[257].

dwatta None known

propta Seed - sow in a cold frame as soon as it is ripe in a pot standing in 3cm of water. Only just cover the seed with soil[200]. The seed usually germinates fairly quickly. Prick out the plants when large enough to handle and plant out in their permanent positions in early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any wet to moisture retentive ground, pond margins and shallow water in full sun or shade[200]. A polymorphic species[60].

## 7.2.385 Skimmia laureola

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Skimmia laureola* is an evergreen Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from April to June. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: CondimentLeaves - cooked. Used as a condiment[272]. The strongly aromatic leaves are used in curries or as a flavouring for other foods[146, 177, 183].

tcanta Essential Incense WoodAn essential oil in the leaves is used in scenting soap[61, 240, 272]. The dried leaves are used as an incense[61, 145, 211]. The fresh leaves are used to make garlands for weddings[211]. Plants can be grown as a ground cover when planted about 1 metre apart each way[208]. Wood - used to make handles of small farming implements such as hoes and axes[272].

dwatta The leaves are used in the treatment of small-pox[240]. The smoke produced by burning them is said to purify the air[240].

propta Seed - can be sown as soon as it is ripe in a cold frame[K]. It also succeeds when sown in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If there is sufficient seed then it can be sown can be in an outdoor seedbed in early spring[200]. Grow the plants on in the seedbed for a couple of years before planting them out in late autumn or early spring. Cuttings of half-ripe wood, July/August in a cold frame[11]. Cuttings of nearly mature side shoots, 7 - 10cm with a heel, September in a cold frame. Slow to root, they should be left for 18 months before moving to their permanent positions. Good percentage[78]. Layering in autumn. Takes 18 months. Good to high percentage[78].

nwatta Succeeds in a well-drained open loam or in a peaty soil in a sunny position[1]. Probably flowers well in the shade[11]. Plants are very tolerant of atmospheric pollution, being unharmed by deposits of soot or a sulphur-laden atmosphere[245]. This species is not very frost-hardy and so is rather tender in much of Britain[1]. The flowers are sweetly scented[184]. The small yellow flowers are oppressively scented, giving a somewhat unpleasant smell near to, though agreeable at a distance[245]. The bruised leaves are strongly aromatic[245]. The plant is superficially similar to *Daphne cannabina* and is often mistaken for that species[211]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.386 Viscum album

Mistletoe, European mistletoe

6 tin 9 cyuc 1 kcaak 0 tcan 3 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Viscum album* is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from February to April, and the seeds ripen from November to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: The ripe fruit is edible[272]. Some caution is advised, see notes above on toxicity[K].

tcanta None known

dwatta Antianxiety Anticonvulsant Antidiarrhoeal Antispasmodic Cardiac Cytostatic Diuretic Epilepsy Hypotensive Narcotic Nerve Stimulant Tonic VasodilatorMistletoe

## 7.2.379 Hydrangea hirta

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprik-  
wis hpa7tmwatli xre7t hjonli

drutta Hydrangea hirta is a deciduous Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[105]. Eaten with rice[177].

tcanta None known

dwatta None known

propta Seed - surface sow in a greenhouse in spring[113]. Cover the pot with paper until the seed germinates[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 8cm long, July/August in a frame. Overwinter in a greenhouse and plant out in late spring[78]. Cuttings of mature wood in late autumn in a frame[200]. Mound layering in spring. Takes 12 months[78]. Leaf-bud cuttings of the current seasons growth in a frame[200].

nwatta Tolerates most soils[200], thriving in a well-drained loamy soil[1], but resenting dryness at the roots[11, 200]. Succeeds in full sun or semi-shade[200], but if it is grown in a low rainfall area then it requires shade at the hottest part of the day[11]. It grows well on very acid soils with a pH around 4.5[200]. Although the dormant plant is quite hardy in Britain, the young growth in spring can be damaged by late frosts. Closely related to *H. scandens*[200]. This species is notably susceptible to honey fungus[200].

## 7.2.380 Onopordum illyricum

Cotton Thistle, Illyrian cottonthistle  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis  
hpa7tmwatli fyfjxre7t hjonli

drutta Onopordum illyricum is a BIENNIAL growing to 1.3 m (4ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: Flower buds - cooked. Used as a globe artichoke (*Cynara scolymus*) substitute[183], though they are even more fiddly than that plant[K].

tcanta None known

dwatta None known

propta Seed - sow spring in situ[200]. The seed can also be sown in situ in autumn[200]. If the seed is in short supply then it can be sown in a pot in the greenhouse in the spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and plant them out into their permanent positions in early summer.

nwatta Succeeds in almost any ordinary garden soil. Requires a well-drained soil in full sun. Prefers a slightly alkaline soil. Plants are hardy to about -15°C. Often self-sows, sometimes to the point of nuisance, though the seedlings can easily be hoed out and can also be transplanted if they are moved whilst still small[200]. The flowers are very attractive to bees.

## 7.2.381 Cistus albidus

Rock Rose

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
htut cyutli hgatkycutcup hwicli hyishrsjlut hpa7tli flatprik-  
wisslip hpa7tmwatli fyfjxre7t hjonli

drutta Cistus albidus is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: Condiment TeaThe leaves are used as a tea substitute[177, 183]. The dried leaves are sometimes used as an adulterant for marjoram (*Origanum majorana*) [183].

tcanta None known

dwatta None known

propta Seed - gather when ripe and store dry[78]. Surface sow in late winter in a greenhouse[164]. The seed usually germinates in 1 - 4 weeks at 20°C[164]. Prick out the seedlings as soon as they are large enough to handle into individual pots. Grow them on in the greenhouse for their first winter and plant them out in the following spring or early summer, after the last expected frosts[164]. The seed stores for at least 3 years[K]. Cuttings of softish to half-ripe wood, 8cm long with a heel or at a node, June/August in a frame. Roots are formed within 3 weeks[78]. High percentage[78]. Cuttings of almost mature wood, 8 - 12cm with a heel or at a node, September/October in a frame. High percentage[78]. Lift and pot up in the spring, plant out when a good root system has formed[78]. Layering in spring.

nwatta Requires a sunny position in a well-drained light sandy soil[1, 182]. Prefers a calcareous soil[190]. Withstands drought once it is established[190]. Tolerates maritime exposure[188]. One of the hardiest species in this genus, tolerating temperatures down to about -15°C[184] and surviving all but the coldest winters in Britain[11], it is however apt to be short-lived[182]. Plants are somewhat hardier when grown in poor soils[182]. Individual flowers only last one day but there is a long succession of them[200]. Dislikes pruning or root disturbance[182, 200]. Plants should be pot grown and then planted out in their final positions whilst still small. Plants in this genus are notably resistant to honey fungus[200]. Hybridizes freely with other members of this genus[200].

## 7.2.382 Ardisia crispata

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 1.2 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

drutta Ardisia crispata is an evergreen Shrub growing to 1.2 m (4ft) by 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from June to July, and the seeds ripen from September to December. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw. Used in salads[218].

tcanta None known

dwatta Antidote Diuretic PectoralThe root is antidiarrhoeal and diuretic[218]. An infusion is pectoral[218]. The plant is crushed and applied to scurf, it is also applied to the ears in the treatment of earache[218].

propta Seed - best harvested when it is ripe in the winter and sown immediately in a greenhouse[1]. Sow stored seed as early in the year as possible. When large enough to handle, prick the seedlings out into individual pots and grow them on in a shady part of the greenhouse for at least their first winter. Plant out into their permanent positions in late spring or early summer, once the plants are 20cm or more

## 7.2.271 Polygonum molle

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

drutta Polygonum molle is a PERENNIAL growing to 2.5 m (8ft 2in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves SeedEdible Uses: Young shoots - raw or cooked as a vegetable[146, 177, 272]. Pleasantly acid, they are used like rhubarb[105]. Seed - raw or cooked. It is rather small and fiddly to utilize.

tcanta Soil stabilizationPlants are very fast growing and are used to reclothe and stabilize land slips[146]. They are best spaced about 1.2 metres apart each way[208].

dwatta AstringentThe whole plant is astringent[240]. propta Seed - sow spring in a cold frame. Germination is usually free and easy. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer if they have reached sufficient size. If not, overwinter them in a cold frame and plant them out the following spring after the last expected frosts. Division in spring or autumn. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Succeeds in an ordinary garden soil[1] but prefers a moisture retentive not too fertile soil in sun or part shade[200]. Repays generous treatment[1]. A very fast growing plant[146]. Plants seem to be immune to the predations of rabbits[233].

## 7.2.272 Podocarpus nubigenus

Chilean Podocarp

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli nyanhjen hjonli

drutta Podocarpus nubigenus is an evergreen Tree growing to 20 m (65ft 7in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. About 8mm long[200]. We have seen no reports for this species but it is most likely that the fruit is edible.

tcanta WoodWood - straight grained, reddish, very durable lasting a long time in water, but it can be brittle. Used for construction work and cabinet making[1, 11, 46, 61, 128].

dwatta None known

propta The seed can be sown at any time of the year in a sandy soil in a warm greenhouse, though it is probably best sown as soon as it is ripe[1]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe terminal shoots, 5 - 10cm long, July/August in a frame[78].

nwatta Prefers a rich moist non-alkaline soil[167]. Shade tolerant, at least when young[200]. This species is hardy to about -25°C, but the plants grow best in humid areas with high rainfall, mild winters and cool summers[200]. They are not really happy in the drier eastern half of the country[11]. Closely related to *P. totara*[200]. A good plant for the rock garden[200]. Very tolerant of pruning[200]. Plants in

this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.273 Picea sitchensis

Sitka Spruce

6 tlin 7 cyuc 2 kcaak 0 tcan 2 dwat 50 m hkuc  
htut cyutli tcuphja7n hwicli hyishrsjlutnyik hpa7tli frusflat-  
prik hpa7tmwatli hjonli

drutta Picea sitchensis is an evergreen Tree growing to 50 m (164ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. The plant can tolerate maritime exposure. It cannot tolerate atmospheric pollution.

kcakta Edible Parts: Flowers Inner bark Seed Seedpoc Uses: Condiment Gum TeaYoung shoots - raw[118, 256]. Young male catkins - raw or cooked. Used as a flavouring[172]. Immature female cones - cooked. The central portion, when roasted, is sweet and syrupy[172]. The cones are 6 - 10cm long[82]. Inner bark - raw or cooked[256]. It can be dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread[172]. The inner bark was usually harvested in the spring, though it was also sometimes taken in the summer[256]. An emergency food, it is only used when all else fails. Seed - raw[172]. The seed is about 2 - 4mm long[229]. It is rich in fats and has a pleasant slightly resinous flavour but is too small and fiddly to be worthwhile unless you are desperate[172, K]. A refreshing tea, rich in vitamin C, can be made from the young shoot tips[172]. A gum obtained from the bark is hardened in cold water and then used for chewing[118, 177, 256]. It should be aged for 3 days or more before using it. The best gum is obtained from the southern side of the tree.

tcanta Adhesive Basketry Fuel Gum Pitch String Varnish Waterproofing WoodThe tough and flexible root is used in basket making and as a string[118, 229]. The roots were burnt over an open fire to remove the bark, then they were dried and split to make hats, ropes etc[257]. The main body material of baskets was made from the roots. These were cut into lengths 75 - 90cm long and 12 - 25mm in diameter. Whilst still full of sap and soft, these were split into broad flat bands and these in turn were sub-divided by knife and teeth until the desired size was obtained - a little larger than coarse thread, about like small twine. The vertical rods were made of hazel (*Corylus* spp) and the overlay was bear grass (*Xerophyllum tenax*) [257]. The roots were used by several native North American Indian tribes to make tightly woven baskets that would hold water[226]. The limbs and roots can be pounded, shredded and used to make ropes[257]. A pitch is obtained from the tree and is used for caulking boats, waterproofing boxes etc[118, 257]. The rendered pitch has been used as a glue[257]. The pitch can be melted then used as a protective varnish-like coat on wood[257]. Wood - strong according to some reports[171, 229], not strong according to others[1, 11, 46]. The quality of the wood for aircraft construction is unsurpassed, it is remarkably strong yet light and its resistance - weight ratio is among the highest[226]. The wood is elastic, soft, light, straight grained. Equal in quality to *P. abies* but more quickly produced, the wood is used for shipbuilding, construction, packing cases, doors, posts etc[1, 11, 46, 226]. The wood is also valued for making musical instruments[226] and is widely used in the pulp industry to make paper[171]. The wood is a good fuel, knotted bits of wood would keep the fire burning all night[257].

dwatta Analgesic Antirheumatic Antitoxic Diuretic Laxative Ophthalmic Pectoral Poultice Salve Stomachic TB Vitamin CSitka spruce was widely employed medicinally by several native North American Indian tribes who used it especially for its antiseptic and pectoral qualities in the treatment of lung complaints, wounds, sores etc[257]. It is little, if at all, used in modern herbalism. The inner bark is laxative[256, 257]. It has been chewed in the treatment

of throat problems, coughs and colds[257]. A decoction of the branch tips and the bark has been used in the treatment of rheumatism, stomach pains, constipation and gonorrhoea[257]. A decoction of the cones has been taken in the treatment of pain[257]. The cones have also been used in steam baths to treat rheumatism[257]. A decoction of the bark has been used as a steam bath in the treatment of back aches[257]. The resin is antiseptic and diuretic[257]. A decoction has been used in the treatment of gonorrhoea[257]. A poultice of the resin has been used as a rub on rheumatic joints[257]. Combined with Indian Hellebore roots (*Veratrum viride*), it has been used as a poultice on rheumatic joints[257]. The resin has also been used as a dressing or poultice on cuts, broken skin, boils, wounds, infections and suppurating sores[257]. The resin has been chewed as a breath freshener and as a treatment for TB[257]. The gum from new shoots and small branches has been placed in the eyes as a treatment for snow blindness[257]. A decoction of the roots has been used in the treatment of diarrhoea[257].

Quercus marilandica

propta Seed - stratification will probably improve germination so sow fresh seed in the autumn in a cold frame if possible[80]. Sow stored seed as early in the year as possible in a cold frame[78]. A position in light shade is probably best[78]. Seed should not be allowed to dry out and should be stored in a cool place[80]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. They can be planted out into their permanent positions in early summer of the following year, or be placed in an outdoor nursery bed for a year or so to increase in size. They might need protection from spring frosts. Cuttings of semi-ripe terminal shoots, 5 - 8cm long, August in a frame. Protect from frost. Forms roots in the spring[78]. Cuttings of mature terminal shoots, 5 - 10cm long, September/October in a cold frame. Takes 12 months[78]. Cuttings of soft to semi-ripe wood, early summer in a frame. Slow but sure.

Quercus marilandica

nwatta Landscape Uses:Screen, Specimen. Likes abundant moisture at the roots, if grown in drier areas it must be given a deep moist soil[11]. Tolerates poor peaty soils[200]. Succeeds in wet, cold, poor and shallow soils[81]. Trees have succeeded on pure chalk when on a north facing hollow deep in beech woods[200]. Prefers a pH between 4 to 6[200]. Dislikes shade[200]. Intolerant of atmospheric pollution[11]. Very tolerant of exposure[81], resisting salt laden gales[172], though trees are not very wind firm in shallow soils[1]. A long-lived tree, with specimens 700 - 800 years old being recorded[229]. It is slow growing for its first two or three years, though it soon becomes an extremely fast growing tree and is very widely planted for timber in Britain and other temperate areas[11, 17]. Even trees 30 metres tall are increasing in height by 1 metre a year[185]. New growth takes place from May to July or August and some very vigorous trees will produce a second flush of growth until September[185]. Although the dormant tree is very cold-hardy, growth can be severely checked if the trees are growing in a frost hollow, because the young shoots are very susceptible to damage by late frosts[125, 185]. In Britain the best stands are produced in the sheltered valleys of W. Scotland. Trees are unsurpassed for rapid volume wood production in cool wet mountain sites on blanket peat in W. Britain[200]. In areas with cool wet summers (1200mm of rain per year) it makes a huge specimen tree[200]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[1, 200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. In some upland areas, especially over granitic or other base-poor soils, growth rate and health have been seriously affected by aluminium poisoning induced by acid rain[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Many trees do not bear female flowers in most years. Subject to damage by the green spruce aphid[1], trees are also often attacked by a bark beetle and so should be kept away from more valuable plantings[125]. A biological control for the bark beetle is being introduced (1990)[125]. Special Features:North American native, Inconspicuous flowers or blooms.

### 7.2.274 Quercus marilandica

Blackjack Oak

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli kyuctup hwicli hysj[utnyik hpa7tli frusflat-priklwis hpa7tmwatli hjonli

drutta Quercus marilandica is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower from April to May, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerates strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: CoffeeSeed - cooked[63, 105]. Used in times of scarcity[257]. The seed is about 2cm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

tcanta Charcoal Fuel Repellent Tannin WoodA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. Wood - heavy, hard, strong, close grained[82]. It weighs 46lb per cubic foot[227], but is too small to be of commercial value and is only used for fence posts, charcoal and fuel[82, 149, 229].

dwatta Astringent Birthing aid DysenteryAn infusion of the tree bark coal has been taken to ease childbirth, remove the afterbirth and ease cramps[257]. Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Landscape Uses:Specimen. Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Trees are tolerant of dry sandy sterile soils[229]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. A slow-growing and short-lived tree[200, 229]. The tree flowers on new growth produced in spring, the seed taking two summers to ripen[229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Inconspicuous flowers or blooms.

kcakta Edible Parts: Edible Uses: ColouringA yellow dye is obtained from the flowers and used as a saffron substitute for colouring foods[61, 177, 183].

tcanta DyeNone known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold greenhouse[1]. The seed usually germinates in 3 - 9 weeks at 20 - 25°C[164]. Stored seed can be sown in early spring in a greenhouse[164]. Sow the seed thinly so that the plants can be grown on undisturbed in their pot for the first year, but give the seedlings an occasional liquid feed to ensure they do not become nutrient deficient. Once the plants are dormant in the autumn, pot up the bulbs putting 2 - 3 bulbs in each pot. Grow them on for another year or two in the greenhouse before planting them out when they are dormant in the autumn. Division in spring as new growth commences[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta A very easily grown plant, it succeeds in almost all soils other than very heavy clays or bogs[233], though it prefers a light rich sandy soil[1, 79] in full sun or light dappled shade[200, 233]. Another report says that it prefers a fairly shady position and plenty of moisture in the growing season[79]. The corms are hardy to about -10°C[200] but in cold areas it is wise to lift them when the plants die down in the autumn, store them in a cool frost-free place over the winter and plant them out in the spring[1]. Make sure the corms do not dry out[1]. It is best to avoid lifting the corms if at all possible since the new corms seem to derive some nutrition from the old corms that have flowered[200]. Plants can divide quite freely when growing in a suitable location[233]. Although the fresh flowers have no perfume, when dried and immersed in warm water they release a scent like that of the saffron crocus[245]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 7.2.377 Conyza canadensis

Canada Fleabane, Canadian horseweed

6 tlin 9 cyuc 1 kcaak 1 tcan 3 dwat 1 m hkuc hmimhtut cyutli hgatkyuctup hwicli hras[ut hpa7tli priklwis hpa7tmwatli hjonli

drutta Conyza canadensis is a ANNUAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to October, and the seeds ripen from July to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: CondimentYoung leaves and seedlings - cooked[105, 177]. Boiled, cooked in rice or dried for later use[183]. A nutritional analysis of the leaves is available[218]. The source of an essential oil that is used commercially for flavouring sweets, condiments and soft drinks[183]. The fresh leaves contain 0.2 - 0.66% essential oil[218].

tcanta EssentialThe plant contains small quantities of essential oil[7]. Since the plant is readily obtainable, extraction of the oil is feasible - it has a special quality that would make it suitable in the making of perfumes with unusual nuances[7, 240].

dwatta Astringent Diuretic Dysentery Emmenagogue Homeopathy Hypoglycaemic Styptic Tonic VD VermifugeIn traditional North American herbal medicine, Canada fleabane was boiled to make steam for sweat lodges, taken as a snuff to stimulate sneezing during the course of a cold and burned to create a smoke that warded off insects[254]. Nowadays it is valued most for its astringency, being used in the treatment of gastro-intestinal problems such as diarrhoea and dysentery[254]. It is said to be a very effective treatment for bleeding haemorrhoids[254]. The whole plant is anti-rheumatic, astringent, balsamic, diuretic, emmenagogue, styptic, tonic and vermifuge[4, 7, 9, 21, 222]. It can be harvested at any time that it is in flower and is best used when fresh[4, 207, 238]. The dried herb should not be stored

for more than a year[238]. The seeds can also be used[4]. An infusion of the plant has been used to treat diarrhoea and internal haemorrhages[213] or applied externally to treat gonorrhoea[213] and bleeding piles[7]. The leaves are experimentally hypoglycaemic[218]. The essential oil found in the leaves is used in the treatment of diarrhoea, dysentery and internal haemorrhages[4, 207, 218]. It is a uterine stimulant[213] and is also said to be valuable in the treatment of inflamed tonsils plus ulceration and inflammation of the throat[4]. A tea of the boiled roots is used to treat menstrual irregularities[213]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of haemorrhoids and painful menstruation[9].

propta Seed - we have no information on this species but suggest sowing the seed in spring in situ. An autumn sowing in situ might also be worthwhile.

nkwalta Prefers a well-drained light or medium neutral to alkaline soil in a sunny position, though it tolerates most conditions[238]. Originally from N. America, Canada fleabane has become naturalized in many areas of the world and is considered to be a nuisance weed in many areas[268]. The plant is very adaptable to differing conditions and can vary dramatically in height, from only a few centimetres in poor soils to as much as 3 metres tall in rich soils[213]. The plant is used commercially as a food flavouring[183]. A good bee plant[200] but unfortunately it also harbours various insect pests such as the tarnished plant bug[1].

## 7.2.378 Eragrostis curvula

Weeping Love Grass

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.2 m hkuc htut cyutli tcup hwicli hras[utnyik hpa7tli flatpriklwis hpa7tmwatli fyikre7t hjonli

drutta Eragrostis curvula is an evergreen Perennial growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Apomictic (reproduce by seeds formed without sexual fusion), wind. The plant is self-ferile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[269]. Used as a grain[269].

tcanta Basketry Biomass Soil stabilizationA deep-rooted plant, it is considered excellent for protecting terraces and for grassing water channels and is valuable for erosion control[269]. In Lesotho, the plant is used to make baskets, brooms, hats, ropes, and candles[269].

dwatta None known

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination should take place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts. The seed can also be sown in situ in mid to late spring, though in a cool summer it may fail to ripen many seeds[162]. Division in spring.

nwatta Easily grown in most well-drained soils so long as the plant is in a hot, dry, sunny position[200]. Weeping love grass is reported to tolerate an annual precipitation of 31 to 163cm, an annual temperature range of 5.9 to 26.2°C and a pH in the range of 5.0 to 8.2[269]. It is adapted to semi-arid and desert areas and sandy soils, growing well on low fertility soils[269]. A very drought-resistant plant, but it lacks hardiness for more northern areas[269]. It grows well on a wide range of well-drained soils, especially sandy loams; moderately frost-resistant in southern areas[269]. Plants are hardy to about -5°C and succeed outdoors in the milder areas of Britain[200]. The roots contain pyrocatechol, suggesting an explanation for the plants resistance to nematodes[269]. The species and its varieties are apomictic (producing seed without fertilization) although sexual plants have occasionally been found[269].

does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Commonly cultivated in China as a medicinal plant, the cultivar 'Phoenix White' has especially vigorous roots and so is the favoured form for medicinal use[214].

### 7.2.373 *Scrophularia umbrosa*

Water Betony, Water figwort  
6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 1.5 m hkuc  
hmmihtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Scrophularia umbrosa* is a PERENNIAL growing to 1.5 m (5ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, wasps. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: RootEdible Uses: Root - cooked[2, 105]. There must be some doubts about the edibility of this root[K].

tcanta None known  
dwatta Detergent Eczema VulneraryThe leaves are detergent and vulnerary[4]. They are harvested as the plant comes into flower and can be used fresh or dried for later use[4]. The plant has a good reputation as a wound herb, either applied externally as a poultice or taken as a decoction[4]. Water betony is said to have similar medicinal properties to the knotted figwort, *S. nodosa*[254]. These properties are as follows:- Knotted figwort is a plant that supports detoxification of the body and it may be used as a treatment for various kinds of skin disorders[254]. The whole plant is alterative, anodyne, anti-inflammatory, diuretic, mildly purgative and stimulant[4, 9, 21, 165]. It is harvested as the plant comes into flower in the summer and can be dried for later use[4]. A decoction is applied externally to sprains, swellings, burns, inflammations etc, and is said to be useful in treating chronic skin diseases, scrofulous sores and gangrene[4, 254]. The leaves can also be applied fresh or be made into an ointment[4]. Internally, the plant is used in the treatment of chronic skin diseases (such as eczema, psoriasis and pruritis), mastitis, swollen lymph nodes and poor circulation[238]. It should not be prescribed for patients with heart conditions[238]. The root is anthelmintic[9].

propta Seed - sow spring or autumn in a cold frame[238]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed then it can be sown outdoors in situ in the autumn or the spring. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most moist soils. A good bee plant[4].

### 7.2.374 *Carex paniculata*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1.5 m hkuc  
hmmihtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Carex paniculata* is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June, and the seeds ripen from June to July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH:

mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

tcanta BeddingThe straw is used for bedding[61].  
dwatta None known

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°c[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.375 *Ipomopsis aggregata*

Skyrocket, Scarlet gilia  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ipomopsis aggregata* is a BIENNIAL/PERENNIAL growing to 1 m (3ft 3in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: NectarEdible Uses: TeaThe plant has been boiled up as a tea[257]. The nectar is sucked from the flowers by children[257].

tcanta Adhesive Disinfectant SoapThe plant is reported to contain saponins[212] and so could possibly be used as a soap substitute[K]. A decoction of the plant has been used as a face and hair wash by adolescent girls[257]. The whole plant has been boiled up to make a glue[257].

dwatta Cathartic Disinfectant Emetic Skin TonicThe whole plant is cathartic and emetic[61, 257]. The leaves are steeped in hot water until the water turns a bright green, this liquid is taken in small doses as a tonic for the blood[207, 257]. An infusion of the whole plant has been used to treat blood diseases[257]. A decoction has been used as a disinfectant wash on itchy skin[257]. A poultice of the whole plant has been applied to rheumatic joints[257]. An infusion of the roots is used as a laxative and in the treatment of high fevers, colds[257].

propta Seed - sow spring in situ[200].  
nwatta Requires a well-drained dry soil in sun or partial shade[187]. Requires a light very well drained fertile soil in full sun[200]. Plants are cold-hardy to about -15°c[187], but they are susceptible to rot in areas with wet winters[260]. It is best to cover the plants with a pane of glass in wet winter areas[260]. A slow-growing[188] and short-lived perennial or biennial species[187]. A polymorphic species[60]. The leaves have a musky scent[187]. The crushed leaves smell like a skunk[212].

### 7.2.376 *Crocsmia aurea*

Montbretia  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 1 m hkuc  
hmmihtut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Crocsmia aurea* is a CORM growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

### 7.2.275 *Duchesnea chrysantha*

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.1 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyfjxre7t hjonli

drutta *Duchesnea chrysantha* is a PERENNIAL growing to 0.1 m (0ft 4in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to October, and the seeds ripen from July to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[105]. The fruit is about 10mm in diameter[200] with the appearance and texture of a strawberry but very little flavour[K]. Leaves and young plant - cooked[105].

tcanta None known  
dwatta None known

propta Seed - sow spring in a sunny position in a greenhouse. Germination usually takes place within 1 - 6 weeks or more at 15°c. A period of cold stratification may speed up germination. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division of runners in spring or late summer. Very easy, they can be planted out straight into their permanent positions.

nwatta Prefers a moist but well-drained soil in a sunny position[175]. Grows well in a rock garden[11]. This species is hardy to about -15°c. Plants can be invasive, spreading freely by means of runners[187]. This species is sometimes considered to be no more than a form of *D. indica*[74].

### 7.2.276 *Achillea ageratum*

Mace, Sweet-nancy  
6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.6 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Achillea ageratum* is a PERENNIAL growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: Condiment TeaLeaves - raw or cooked. The initial flavour is mild and pleasant, though it becomes stronger and aromatic when the leaves are chewed, and leaves a tingy sensation in the mouth[K]. They make an acceptable addition to mixed salads, the plant is very productive, though the leaves are rather small and fiddly to pick in quantity[K]. They are also used in soups, stews etc., and as a flavouring in potato salad etc[183]. The aromatic leaves are used as a tea substitute[183].

tcanta None known  
dwatta None known

propta Seed - sow spring or early autumn in a cold frame[133]. The seed usually germinates in 1 - 3 months[133]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If this species is a hybrid it might not breed true from seed. Division in spring or autumn. Very easy, the divisions can be planted direct into their permanent positions. Basal cuttings of new shoots in spring. Very easy, collect the shoots when they are about 10cm tall, potting them up individually in pots and keeping them in a warm but lightly shaded position. They should root within 3 weeks and will be ready to plant out in the summer.

nwatta Succeeds in most soils but prefers a well-drained soil in a sunny position[1, 200]. It also succeeds in partial shade[187]. Plants live longer in a poor soil[200]. Established plants are very drought tolerant, they can show

distress in very severe droughts but usually recover[190]. Plants succeed in maritime gardens[233]. Hardy to about -20°c[187]. An excellent plant to grow in a large pot, the long stems will tend to arch down and continue to flower for a long time[244]. The leaves have a pungent aroma, especially when the plant is grown in a hot sunny position[245]. The plant is intermediate between *A. millefolium* and *A. ptarmica* in its characteristics[233]. There is at least one named variety, selected for its ornamental value[233]. Hybridizes freely with other members of the genus[200].

### 7.2.277 *Paederia foetida*

Skunk Vine  
6 tlin 12 cyuc 2 kcaak 2 tcan 4 dwat 4 m hkuc  
hmmihtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwish-som hpa7tmwatli dyat hjonli

drutta *Paederia foetida* is a CLIMBER growing to 4 m (13ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. The flowers are pollinated by Bees, Butterflies. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves StemEdible Uses: Leaves - raw or cooked[301 J]. Although they have a strong flavour, the leaves are sometimes mixed with grated coconut and spices, and then eaten raw as a side-dish with rice[301, 310 J]. The minced leaves are steamed and eaten; they can be added to soups; or are mixed with various vegetables and spices, then wrapped in a banana leaf and cooked over a fire[301 J]. Any offensive smell disappears as the leaves are cooked[301 J]. The leaves are valued more for their medicinal virtues than for their flavour[K J]. The sweet stem juice is sucked in Taiwan[177, 183 J].

tcanta Other Uses The stem yields a strong and silky fibre, but it is not commercially exploited[310 J]. An ethanolic extract of the leaves and stem has been shown to be significantly toxic against the aphid *Myzus persicae* infesting cabbage in India[310 J]

dwatta DysenteryThe leaves are widely used in Asia and South-East Asia, where they are especially valued for treating digestive problems[310 J]. Considerable research has been carried out into the medicinal benefits of the plants, with several active compounds having been recorded[310 J]. Several iridoid glucosides such as asperuloside, scandoside and paederoside have been isolated from the aerial parts of the plant[310 J]. These glucosides have displayed antitumor activity with paederoside displaying the highest degree of antitumor-promoting activity[310 J]. Scandoside has been shown to promote the growth of lettuce seedlings. Paederoside showed a similar inhibitory activity to that of asperuloside and daecetyl-asperulosidic acid in a plant growth inhibition test and in an antimicroorganism activity test[310 J]. The brewed aerial parts of the plant have the fetid odour of indole (methyl-mercaptopan). Damage to the tissue releases an enzyme which splits off this sulphur-containing group from paederoside, and is therefore responsible for the unpleasant odour. The most abundant sulphur-containing compound was dimethyl disulphide[310 J]. The presence of alkaloids and an essential oil have also been recorded[310 J]. Monoterpenes such as linalol constitute the major components in the oil[310 J]. In older investigations, decoctions of the plant showed significant anti-inflammatory action against arthritis[310 J]. The decoction also exhibited marked activity against degenerative osteo-arthritis[310 J]. The water soluble fraction of the aerial parts displayed anti-inflammatory activity in oedema[310 J]. It failed to exhibit any analgesic or antipyretic action and showed no ulcerogenic potential[310 J]. An ethanolic extract of the leaves has shown anticancer activity against human epidermoid carcinoma of the nasopharynx[310 J]. A methanol extract of the leaves has shown hepatoprotective potential, being effective in reversing 6 out of 12 common biochemical (enzymatic) parameters assessed[310 J]. Another study has shown that the plant has antiarthroal activity, acting by inhibiting intestinal motility - thus supporting its use in traditional medicine[360 J]. The leaves are anodyne, antirheumatic, antivenous, astringent, carminative, depurative, diuretic, restorative and ver-

mifuge[147 , 218 , 310 ]. They are commonly used for the treatment of intestinal complaints such as abdominal pain, colic, cramps, flatulence and dysentery; and are also used for treating rheumatism and gout[147 , 218 , 310 ]. The leaves are also used to treat infertility and paralysis[218 ]. The leaves and stems are also used as a diuretic for inflammation of the urethra[310 ]. For treating intestinal problems, the fresh leaves are pounded, water added, and the filtered infusion is drunk regularly till convalescence[310 ]. The plant is considered to have great restorative powers, and the leaves may thus be mixed with food, boiled and eaten - in India, they are often boiled in soup to lessen their smell[310 ]. Applied externally, the leaves are used to treat swellings and bruises in general, and are mashed then applied for earache, ulcerations of the nose and swollen eyes[272 , 310 ]. They are used as a poultice for treating a swollen belly, distension, herpes or ringworm; and are used in antihelmthic baths[310 ]. They are applied to the abdomen as a diuretic, and also as a solvent for vesical stones[310 ]. The juice of the leaves is considered astringent, and is used to treat diarrhoea in children[310 ]. The bark and the root are considered to be emetic[310 ]. The juice of the root is prescribed in cases of indigestion, piles, inflammation of the spleen, and pain in the chest and liver[272 , 310 ]. It may help to eliminate poisons collected in the system[310 ]. In some parts of India, the fruit is used to blacken teeth, and it is also considered a medicine to prevent and treat toothache[310 , 360 ].

propta Seed - despite its weediness, the plant germinates rather slowly, with tetraploids germinating quicker than hexaploids, in 5 - 22 days, or in 17 - 24 days, respectively[310 ]. Layering. Sometimes, shoots produce adventitious roots when they come in contact with the soil, and can thus be propagated[310 ]

nwatta Found in a range of environments from the warm temperate zone to the tropics. It is tolerant of at least some frost[413 ]. Succeeds in any fertile soil so long as it is well drained[182 , 219 ]. Plants have a wide ranging adaptability to different levels of light, types of soil, and salt conditions[413 ]. Requires a sunny sheltered position[219 ]. A very variable plant[58 ]. The plant has escaped from cultivation and become naturalised in many areas[310 ]. It has become a serious weed of young sugarcane[305 ]. The vines climb over shrubs and trees, weighing them down and impeding regeneration[413 ]. They also invade pastureland and are troublesome along roads and on power lines[413 ]. The seeds may be dispersed by birds and the plant is also spread by the transport of rooted fragments[413 ]. The plant can be found flowering and fruiting throughout the year in tropical and subtropical conditions; in other localities, it flowers during the rainy season, and fruits early in the dry season[310 ]. Individual flowers are short-lived, open early in the morning and fall off after 2 days; entire inflorescences, however, bear flowers for a long period of time[310 ]. Flowering Time: Mid Summer Late Summer/Early Fall. Bloom Color: Red White/Near White.

## 7.2.278 Thymus zygis

6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc htut cyutli hgtakuyctcup hwicli hyishrasjlut hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Thymus zygis is an evergreen Shrub growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentThe leaves are used as a condiment[177, 183]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is used in perfumery, as a mouth wash, medicinally etc[200]. This plant is the main commercial source of thyme oil[238].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are

strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -10°C but are best given some protection in the winter, a pane of glass supported above the plant is usually adequate[1]. This species is harvested commercially for its essential oil[218]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 7.2.279 Dactylorhiza incarnata

Marsh Orchid

6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Dactylorhiza incarnata is a BULB growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. Very nutritious[4, 46, 61]. It is a source of 'salep', a fine white to yellowish-white powder that is obtained by drying the tuber and grinding it into a powder[2, 105, 177]. Salep is a starch-like substance with a sweetish taste and a faint somewhat unpleasant smell[4]. It is said to be very nutritious and is made into a drink or can be added to cereals and used in making bread etc[100, 183]. One ounce of salep is said to be enough to sustain a person for a day[100, 115].

tcanta None known

dwatta Demulcent NutritiveSalep (see above for more details) is very nutritive and demulcent[4]. It has been used as a diet of special value for children and convalescents, being boiled with water, flavoured and prepared in the same way as arrowroot[4]. Rich in mucilage, it forms a soothing and demulcent jelly that is used in the treatment of irritations of the gastro-intestinal canal[4]. One part of salep to fifty parts of water is sufficient to make a jelly[4]. The tuber, from which salep is prepared, should be harvested as the plant dies down after flowering and setting seed[4].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move.

first winter, planting out after the last expected frosts. Suckers are sometimes produced at some distance from the parent plant. These suckers can be potted up in early spring, then grown on for a year before planting them out into their permanent positions.

nwatta Landscape Uses:Border, Foundation, Pest tolerant, Massing, Screen, Specimen, Woodland garden. Prefers a light, moist well-drained loam and a sheltered position[1, 11] Prefers a humus-rich lime-free soil[182, 200]. A plant of woodland shade in its native habitat, in the less sunny British climate it succeeds in sun or semi-shade[200, 260]. This species is not very cold-hardy, it tolerates temperatures down to between -5 and -10°C, only succeeding outdoors in the mildest areas of Britain[1, 11, 166]. A slow-growing tree[200], the whole plant is very aromatic[182]. The bruised leaves have a strong scent of aniseed, whilst the flowers have a powerful spicy odour[245]. Suckers can spring up at some distance from the parent plant[260]. Special Features:Attracts birds, Attractive foliage, North American native, Fragrant foliage, Wetlands plant, Suitable for cut flowers, Attractive flowers or blooms. The plant is heat tolerant in zones 9 through 7. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. A clumping plant, forming a colony from shoots away from the crown but with a limited spread [1-2]. The root pattern is suckering with new plants from underground runners away from the plant [1-2].

## 7.2.371 Gunnera tinctoria

Gunnera, Chilean gunnera

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 2 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikkwis hpa7tmwatli xre7t hjonli

drutta Gunnera tinctoria is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: StemEdible Uses: Young leaf stalks - peeled and cooked as a vegetable or eaten raw[2, 177, 183]. Acid and refreshing[139].

tcanta Dye Roofing TanninA black dye is obtained from the root[139]. The root contains 9% tannin[46, 139]. Leaves are used as a roof covering[139].

dwatta AstringentThe whole plant is astringent[139].

propta Seed - best sown as soon as it is ripe in the autumn in a sandy mix in a cold frame. The seed can also be sown in a shady position in a greenhouse in the spring. Germination usually takes place within 2 - 8 weeks at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division as new growth commences in the spring. The clumps can be planted out direct into their permanent positions.

nwatta Requires a damp humus rich soil in a sunny position or semi-shade, sheltered from strong winds. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. The rootstock is rather tender, surviving to -10°C and requiring some protection away from the milder parts of Britain. This can be achieved by piling either bracken or the plants drying leaves around the crown[187]. The top part of the inflorescence is male, the bottom is female and the middle is hermaphrodite. A very ornamental plant with huge leaves, it forms a slowly spreading dense

clump[187]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.372 Paeonia ostii

Tree Peony

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikkwissip hpa7tmwatli fixfure7t hjonli

drutta Paeonia ostii is a deciduous Shrub growing to 1.5 m (5ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: The following use is for P. suffruticosa. It quite probably also applies to this closely-related species.[K - see 214]. Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or cooked in various dishes[183].

tcanta None known

dwatta Analgesic Antibacterial Antiinflammatory AntispasmodicA tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250]. The following uses are for P. suffruticosa. They quite probably also apply to this closely related species.[K - see 214]. The root and root bark is analgesic, antibacterial, anti-inflammatory, antipyretic, antispasmodic, emmenagogue, sedative, stypitic and tonic[46, 61, 174, 176, 178, 218]. An extract of the plant has antibacterial activity[218]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastro-intestinal infections[238]. This remedy should only be used under the supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (Glycyrrhiza spp)[218]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K].

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -20°C[184], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. A very ornamental plant[1]. It grows best in areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants come into growth early in the year and are then subject to damage by late frosts, so are best sited in a position that is shaded from the early morning sun[11]. The branches are brittle and very subject to wind damage, especially when young[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. The plant



plant[1], it is closely related to *R. australe*[200]. Hybridizes freely with other members of this genus[200]. Cultivated as a medicinal plant in China[61]. Plants at the Cambridge Botanical Gardens in September 1993 were growing well in the shade of a woodland garden, though they were not succeeding when planted closely to the trees[K]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 7.2.368 *Nandina domestica*

Sacred Bamboo, Heavenly Bamboo  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 2.5 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Nandina domestica* is an evergreen Shrub growing to 2.5 m (8ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: Fruit LeavesEdible Uses: Fruit[2]. No further details are given, but another report says that the fruit is poisonous[147]. The fruit is about 10mm in diameter[200]. Young leaves - boiled[177]. The water must be changed at least once during the cooking[105].

tcanta Hedge HedgePlants are used for hedging in warm temperate zones[200].

dwatta Antirheumatic Antitussive Astringent Febrifuge Stomachic TonicThe roots and stems are antitussive, astringent, febrifuge, stomachic and tonic[147, 174]. A decoction is used in the treatment of fever in influenza, acute bronchitis, whooping cough, indigestion, acute gastro-enteritis, tooth abscess, pain in the bones and muscles and traumatic injuries[147]. It is especially useful in the treatment of children's coughs[174]. There is a danger that an overdose can cause respiratory paralysis[174]. A decoction of the leaves is tonic[218]. The fruit is febrifuge and tonic[218]. Another report says that it is toxic, so great care should be employed if using it[147]. The root is antirheumatic[218]. Young shoots contain high concentrations of laetrile - up to 20% on a zero moisture basis[218].

propta Seed - best sown as soon as it is ripe in a greenhouse[113]. Stored seed should be sown as early in the year as possible in a greenhouse. Germination is often poor[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 15cm long, July/August in a frame[78]. Pot up in the autumn and overwinter in a cold frame. Plant out in late spring. High percentage[78] but very slow[11]. Cuttings of mature wood, 10 - 15cm with a heel, November in a frame[78]. Plant out the following autumn[78, 200]. High percentage[78] but very slow[11].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden, Screen, Specimen. Requires a deep rich moist soil in a sheltered sunny position[11, 200]. Prefers a cool but sunny position[200]. A very ornamental plant, it only successful outdoors in Britain in favoured localities[1]. Grows well in Cornwall[59]. Tender when young[11], the shoot tips of mature plants can be damaged by hard frosts[200]. A number of named forms have been developed for their ornamental value[182]. Untidy old stems on established plants can be pruned to the base in spring[188]. Cultivated for its fruit in China and Japan[2] (does this refer to medicinal usage?). It does not fruit freely in Britain[11]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attracts birds, Attractive foliage, Not North American native, Invasive, Naturalizing, Attractive flowers or blooms.

## 7.2.369 *Eupatorium japonicum*

Pei Lan  
6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Eupatorium japonicum* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Young leaves - cooked. Boiled and well seasoned[177]. Root - cooked. It is sometimes eaten for food and is considered beneficial to the circulation[218].

tcanta None known  
dwatta Anodyne Antibacterial Antidandruff Antiviral Carminative Diaphoretic Diuretic Nervine Vermifuge Women's complaintsThe leaves and stems are anodyne, antibacterial, antiviral, carminative, diaphoretic, diuretic, nervine and vermifuge[176, 218]. They are taken internally in the treatment of indigestion, nausea, vomiting, diarrhoea, feverish colds etc[147, 176, 238]. In excess the plant causes irritation to the stomach[238]. The leaves and stems are harvested in the summer before the flower buds open, and are dried for later use[238]. The plant contains the essential oil thymol. In large doses this can cause various health problems such as headaches, tinnitus, vertigo, inhibition of respiration and the circulation[176]. Use with caution[176]. The seed is prescribed in China for the '36 diseases of women'[218]. The root is considered to be beneficial to the circulation and a restorative to women after parturition[218]. It is harvested in the autumn and dried for later use[238]. The herbage, soaked in oil, is applied to the hair as a treatment for dandruff[218].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Succeeds in ordinary well-drained but moisture retentive garden soil in sun or part shade[200]. A very polymorphic species[58], it is closely related to *E. cannabinum*[1]. This species is a member of natural moist grassland flora on river banks in the Kanto District of Japan. Due to urbanization of this area, the habitat is now restricted to a very small area, and the species is endangered[275]. Plants seem to be immune to the predations of rabbits[233].

## 7.2.370 *Illicium floridanum*

Aniseed Tree, Florida anisetree, Purple Anise, Star Anise, Florida anise  
6 tlin 10 cyuc 1 kcaak 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Illicium floridanum* is an evergreen Shrub growing to 2 m (6ft) by 2 m (6ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: CondimentSaid to be used as a spice[105, 177, 183]. No further details are given, but the leaves have a strong aroma of aniseed[245].

tcanta None known  
dwatta None known  
propta Seed - it does not require pre-treatment and can be sown in early spring in a greenhouse[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant out in late spring or early summer, after the last expected frosts, and give some protection from the cold over the winter for the first year or two. Layering in early spring. Takes 18 months[78]. Cuttings of half-ripe wood, August in a frame[113]. Pot up the cuttings when they start to root and grow them on in the greenhouse for their

Division in autumn. The plant is very intolerant of root disturbance, any moving or dividing should be attempted in the autumn, keep a large ball of soil around the plant[1]. Division of the tubers as the flowers fade[230]. This species produces a new tuber towards the end of its growing season. If this is removed from the plant as its flowers are fading, the shock to the plant can stimulate new tubers to be formed. The tuber should be treated as being dormant, whilst the remaining plant should be encouraged to continue in growth in order to give it time to produce new tubers[230]. Division can also be carried out when the plant has a fully developed rosette of leaves but before it comes into flower[230]. The entire new growth is removed from the old tuber from which it has arisen and is potted up, the cut being made towards the bottom of the stem but leaving one or two roots still attached to the old tuber. This can often be done without digging up the plant. The old tuber should develop one or two new growths, whilst the new rosette should continue in growth and flower normally[230].

nwatta Very easily grown in any good moist soil[42]. Another report says that it requires a deep rich soil[1]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. A polymorphic species[17], it also hybridizes readily with other members of the genus[230]. This species is a colonizer of disturbed ground and bare soils, new colonies can spring up many kilometres from the plants nearest known locality[230]. They have been known to colonize sites such as waste heaps of clinker at power stations[230]. Plants are very impatient of root disturbance[1].

## 7.2.280 *Cichorium spinosum*

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Cichorium spinosum* is a BIENNIAL/PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcaakta Edible Parts: LeavesEdible Uses: Leaves - boiled[148].

tcanta None known  
dwatta None known  
propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Succeeds in any moderately fertile well-drained soil[200]. Prefers a medium to light sandy or gravelly soil that is rich in humus[1]. Prefers a sunny position[200] but with light shade in the summer to prevent plants running to seed.

## 7.2.281 *Brassica rapa campestris*

Wild Turnip  
6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Brassica rapa campestris* is a ANNUAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow

in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves Oil OilEdible Uses: Oil OilLeaves - raw or cooked. A strong radish/cabbage flavour. An edible oil is obtained from the seed, it is best when cold pressed[171]. Some varieties are rich in erucic acid which can be harmful[K].

tcanta Oil OilThe seed contains up to 45% of a semi-drying oil. It is used as a lubricant, luminant and in soap making[1, 46, 57, 61, 74, 171].

dwatta Antiscorbatic Vitamin CThe tuberous roots and seeds are considered to be antiscorbatic[243]. A rather strange report, the leaves are much more likely to contain reasonable quantities of vitamin C than the roots or seeds[K].

propta Seed - sow spring or autumn in situ.  
nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[16, 200]. Succeeds in any reasonable soil but prefers one on the heavy side[16]. Tolerates a pH in the range 4.8 to 8.3. This is the wild form of the turnip with a non-tuberous tap-root[17]. It is closely related to the cultivated forms that are grown for their edible oil-bearing seeds[17].

## 7.2.282 *Brassica rapa trilocularis*

Indian Colza  
6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Brassica rapa trilocularis* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves Oil OilEdible Uses: Oil OilLeaves - raw or cooked. Used as a vegetable or fermented and stored for winter use[272]. A bit on the coarse side, though the young leaves can be added in moderation to salads whilst older leaves make an acceptable vegetable[K]. An edible oil is obtained from the seeds. It is used for cooking[272].

tcanta Lighting Oil OilThe oil from the seed is used for lighting[272]. The seed husks are used in plastering house walls[272].

dwatta None known  
propta Seed - sow in situ April to September[206]. Some varieties can also be sown in a cold greenhouse in late autumn, winter or early spring to provide leaves overwinter and in late spring.

nwatta Succeeds in full sun in a well-drained fertile preferably alkaline soil[200]. Prefers a light sandy soil and dislikes a heavy soil[37]. Prefers cool moist growing conditions[16]. Succeeds in any reasonable soil. Tolerates a pH in the range 4.3 to 8.3. Indian colza is cultivated mainly in India and Nepal for its oil-rich seeds.

## 7.2.283 *Pleioblastus gramineus*

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 3 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Pleioblastus gramineus* is an evergreen Bamboo growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: StemEdible Uses: Young shoots - cooked[105, 177].

tcanta Plant supportCanes are thin-walled but strong and can be used as plant supports[25, 195].

dwatta None known

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°C. Stored seed should be sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse or cold frame until they are large enough to plant out, which could be a number of years. The plants only flower at intervals of several years and so seed is rarely available. Division as the plant comes into growth in spring. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200].

nwatta Succeds in most soils but prefers a good loamy soil[1] in a sheltered position in semi-shade[25]. Dislikes drought[1]. Requires shelter from N. and N.E. winds[11]. Closely related to *P. hindisi*[1]. The rootstock is running and invasive[25]. New shoots are produced from late May[25]. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of several years, they often produce fertile seed[122]. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They occasionally die after flowering, but if left alone they will normally recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122].

## 7.2.284 Santolina chamaecyparissus

Cotton Lavender

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.6 m hkuc htut cyutli hgatkyuctup hwicli hyshrasjlut hpa7tli flatprkl-wisslip hpa7tmwatli xre7t hjonli

drutta Santolina chamaecyparissus is an evergreen Shrub growing to 0.6 m (2ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritional poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckakta Edible Parts: Edible Uses: CondimentThe aromatic leaves are used as a flavouring for broths, sauces, grain dishes etc[15, 183].

tcanta Disinfectant Dye Essential Hedge Hedge Pot-pourri RepellentPlants can be grown as a low formal hedge and used as an edging plant[200]. The plant is very tolerant of shearing[200]. In less exposed areas the plants can be trimmed in the autumn, otherwise they need to be cut by early April if they are to be allowed to flower[245]. Plants can also be grown for ground cover[190]. They are best spaced about 60cm apart each way[208]. The leaves are strewn amongst clothes to repel moths etc[4, 15, 18, 20, 100]. The growing plant repels various insect pests, especially cabbage moths[201]. The dried leaves are used in pot-pourri[238]. An essential oil from the leaves is used in perfumery[4], the oil is also obtained from the flowers[168].

dwatta Antispasmodic Disinfectant Emmenagogue Stings VermifugeThe leaves and flowering tops are antispasmodic, disinfectant, emmenagogue, stimulant and vermifuge[4, 7, 11, 201]. Cotton lavender is rarely used medicinally[238], though it is sometimes used internally as a vermifuge for children and to treat poor digestion and menstrual problems[4, 238]. When finely ground and applied to insect stings or bites, the plant will immediately ease the pain[7]. Applied to surface wounds, it will hasten the healing process by encouraging the formation of scar tissue[7]. The leaves and flowering stems are harvested in the summer and dried for later use[238].

propta Seed - sow spring in a greenhouse. Does not require pre-treatment[113]. Prick out the seedlings into indi-

vidual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer of the following year. Cuttings of half-ripe side shoots, 5 - 8 cm long with a heel, July/August in a frame. Roots within 2 weeks. High percentage[78]. The heeled cuttings can also be placed direct into the open garden in early July and should be well-rooted by the winter[245]. Division in spring or autumn[111]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Layering.

nwatta Landscape Uses:Border, Foundation, Ground cover, Massing, Rock garden, Seashore. An easy and undemanding plant that does not require a rich soil, though it strongly dislikes wet conditions around the roots[1, 11, 15, 200]. Prefers a light sandy fairly poor soil on a sunny slope[200]. Prefers a chalky soil[190]. Established plants are drought tolerant[190]. They succeed in a hot dry position[190]. Hardy to about -15°C when in a well-drained soil. A very wind hardy plant, it succeeds on the top of Cornish dry-stone walls[49]. A very ornamental plant[1], there are several named varieties[245]. Cotton lavender tolerates shearing so long as this is not done at times of low resistance (winter?) [200]. Plants can be cut back hard in spring to maintain their form[200, 208], though this will prevent them flowering[208]. A good companion plant for roses[201]. Flowers are produced on two year old wood[182]. The leaves are very aromatic[190]. The bruised leaves are pleasantly pungent, though the flowers have an unpleasant smell[245]. The form *S. chamaecyparissus nana* has a more pungent aroma than the type[245]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attractive foliage, Fragrant foliage, Not North American native, Suitable for dried flowers.

## 7.2.285 Lavandula latifolia

Spike Lavender, Broadleaved lavender

6 tlin 9 cyuc 2 kcaak 5 tcan 2 dwat 0.4 m hkuc

htut cyutli hgatkyuctup hwicli hrasjlutnyk hpa7tli flatprkl-wishsom hpa7tmwatli xre7t hjonli

drutta Lavandula latifolia is an evergreen Shrub growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

ckakta Edible Parts: Edible Uses: CondimentLeaves - raw[2, 15]. Used as a condiment in salads[177]. Very aromatic[7], they cannot be eaten in quantity[K]. An essential oil from the flowers is used as a food flavouring[183].

tcanta Essential Incense Pot-pourri RepellentAn essential oil is obtained from the flowers - used in soap making, perfumery, food flavouring, veterinary medicines, porcelain painting etc[46, 61]. This species yields up to three times the quantity of essential oil than is obtained from *L. angustifolia*, but the quality is inferior to that species[4, 11, 171]. When growing the plant for its essential oil content, it is best to harvest the flowering stems as soon as the flowers have faded[245]. The aromatic leaves and flowers are used as an insect repellent in the linen cupboard etc[46, 61]. They are also used in pot-pourri[245] and are said to repel mice[20]. The flowering stems, once the flowers have been removed for use in pot-pourri etc, can be tied in small bundles and burnt as incense sticks[245].

dwatta Abortifacient Antibacterial Antiseptic Antispasmodic Aromatherapy Carminative EmmenagogueSpike lavender has similar medicinal properties to common lavender (*L. angustifolia*). It yields more essential oil than that species but is of inferior quality[254]. The flowering stems, and the essential oil obtained from them, is abortifacient, antibacterial, antiseptic, antispasmodic, carminative and emmenagogue[46, 61, 254]. They can be used in all the ways that common lavender is used, externally to treat wounds,

## 7.2.365 Coprosma rugosa

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprkl hpa7tmwatli nyshhjen hjonli

drutta Coprosma rugosa is an evergreen Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year; in flower from January to February, and the seeds ripen from August to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: FruitEdible Uses: CoffeeFruit - raw or cooked. Freely produced in Britain, it is sweet but with little flavour[225]. The fruit is white or blue and about 8mm long x 6mm wide[200, 225]. The roasted seed is an excellent coffee substitute[153].

tcanta Dye Hedge HedgeTolerant of heavy trimming, the plant makes a good hedge[225]. A yellow dye is obtained from the wood, it does not require a mordant[153].

dwatta None known

propta Seed - probably best sown as soon as it is ripe in a greenhouse or cold frame[K]. Sow stored seed in spring in a cold frame[200]. Germination can be slow, often taking more than 12 months even when fresh seed is used[K]. When the seedlings are large enough to handle, prick them out into individual pots. Grow on the plants for at least their first winter in a greenhouse and plant out in late spring or early summer. Give the plants some protection from the cold for their first winter outdoors[K]. Cuttings of mature wood of the current year's growth, autumn in a frame.

nwatta Requires a moist, very well-drained neutral to slightly acid soil in full sun or light shade[200]. Succeeds in moist soils[225]. Somewhat intolerant of frost, this species is only likely to succeed outdoors in the mildest areas of Britain[200]. Another report says that it is quite hardy in Britain[225]. Hybridizes freely with other members of this genus[200, 225]. Plants are tolerant of heavy clipping or pruning[225]. Plants are normally dioecious, though in some species the plants produce a few flowers of the opposite sex before the main flowering and a few hermaphrodite flowers are sometimes produced[225]. Male and female plants must usually be grown if seed is required.

## 7.2.366 Vaccinium sprengelii

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc

hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Vaccinium sprengelii is an evergreen Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: Fruit LeavesEdible Uses: Fruit - raw or cooked[177]. The fruit is about 5mm in diameter[200]. Leaves[177]. No more details are given.

tcanta None known

dwatta None known

propta Seed - sow late winter in a greenhouse in a lime-free potting mix and only just cover the seed[78]. Stored seed might require a period of up to 3 months cold stratification[113]. Another report says that it is best to sow the seed in a greenhouse as soon as it is ripe[200]. Once they are about 5cm tall, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame[78]. Slow and difficult. Layering in late summer or early autumn[78]. Another report says that

spring is the best time to layer[200]. Takes 18 months[78]. Division of suckers in spring or early autumn[113].

nwatta Requires a moist but freely-draining lime free soil, preferring one that is rich in peat or a light loamy soil with added leaf-mould[11, 200]. Prefers a very acid soil with a pH in the range of 4.5 to 6, plants soon become chlorotic when lime is present. Succeeds in full sun or light shade though it fruits better in a sunny position[200]. Requires shelter from strong winds[200]. Dislikes root disturbance, plants are best grown in pots until being planted out in their permanent positions[200]. A polymorphic species[109], it is closely related to *V. dulcoulxii*[182]. Plants are deciduous in cold climates[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.367 Rheum officinale

Chinese Rhubarb

6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 2 m hkuc

hmimhtut cyutli tcup hwicli jlutnykifrip hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Rheum officinale is a PERENNIAL growing to 2 m (6ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: StemEdible Uses: RutinLeaf stem - cooked or raw[177, 178]. Rather medicinal[105]. One report says that the plant contains 1.3% rutin[240]. It does not specify which part of the plant, though it is likely to be the leaves[K].

tcanta Plants can be grown for ground cover when spaced about 1.8 metres apart each way[208].

dwatta Anticholesterolemic Antiseptic Antispasmodic Antitumor Aperient Astringent Chologogue Diuretic Stomachic TonicRhubarb has a long and proven history of herbal usage, its main effect being a positive and balancing effect upon the whole digestive system. It is one of the most widely used herbs in Chinese medicine[218, 238]. The root is anticholesterolemic, antiseptic, antispasmodic, antitumor, aperient, astringent, chologogue, demulcent, diuretic, laxative, purgative, stomachic and tonic[4, 147, 171, 176, 218, 238]. The roots contain anthraquinones, which have a purgative effect, and also tannins and bitters, which have an opposite astringent effect[244]. When taken in small doses, it acts as an astringent tonic to the digestive system, whilst larger doses act as a mild laxative[232, 244]. The root is taken internally in the treatment of chronic constipation, diarrhoea, liver and gall bladder complaints, haemorrhoids, menstrual problems and skin eruptions due to an accumulation of toxins[238]. This remedy is not prescribed for pregnant or lactating women, nor for patients with intestinal obstruction[238]. Externally, the root is used in the treatment of burns[238]. The roots are harvested in October from plants that are at least six years old, they are then dried for later use[4]. A homeopathic remedy is prepared from the dried root[232]. This is used especially in the treatment of diarrhoea in teething children[232].

propta Seed - best sown in autumn in a shaded cold frame[200]. The seed can also be sown in spring in a cold frame. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Division in early spring or autumn[1, 111]. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Prefers a deep, fertile, moderately heavy, humus rich, moisture retentive, well-drained soil in sun or semi-shade[200]. Grows well in heavy clay soils. Plants can be grown in quite coarse grass, which can be cut annually in the autumn[233]. Hardy to about -20°C[200]. A very ornamental

plant is extremely vigorous and essentially disease and pest free[269]. Qing Hao is a determinate short-day plant. Non-juvenile plants are very responsive to photoperiodic stimulus and flower about two weeks after induction. The critical photoperiod seems to be about 13.5 hours, but there are likely to be photoperiod x temperature interactions. In Lafayette Indiana, USA (40°21'N) plants flower in early September with mature seeds produced in October. The plant is not adapted to the tropics because flowering will be induced when the plants are very small[269]. Most collections of artemisia derive from natural stands with highly variable artemisinin content, some as low of 0.01%. Selections from Chinese origin vary from 0.05 to 0.21%. Swiss researcher N. Delabays reports a clonal selection derived from Chinese material which produces 1.1% artemisin but is very late flowering; proprietary hybrids had been obtained with somewhat lower content but flower earlier[269]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.362 Ilex coriacea

Large Gallberry  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex coriacea is an evergreen Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[43]. No more details are given but I would have some doubts on the wholesomeness of the fruit[K].The fruit is about 6 - 10mm in diameter[200].

tcanta None known  
dwatta None known  
propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils that are not water-logged[200]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. This species is closely related to *I. glabra*[43]. Flowers are produced on the current year's growth[229]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.363 Lindera umbellata

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta Lindera umbellata is a deciduous Shrub growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy

to UK zone 7. It is in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: OilEdible Uses: Condiment OilThe decoction is poured over rice or millet and eaten[105, 177]. We have no more details.

tcanta OilAn oil obtained from the seed is used for lighting[61].

dwatta None known  
propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse. The seed has a short viability and should not be allowed to dry out[200]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, July in a frame[200]. Layering.

nwatta Requires a lime-free rather moist soil[200]. Prefers partial shade or dappled sunlight in a fertile moisture-retentive soil enriched with leafmould[200]. Succeeds in full sun or semi-shade[182, 184]. Hardy to about -15°c[184]. Plants can be pruned right back to the base if required, though any drastic pruning is best spread over several seasons[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious, male and female plants must be grown if seed is required.

## 7.2.364 Sasamorph borealis

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 3 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Sasamorph borealis is an evergreen Bamboo growing to 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked. It is used as a cereal[177]. The seed is only produced at intervals of several years.

tcanta None known  
dwatta None known

propta Seed - if possible, surface sow the seed as soon as it is ripe in a greenhouse at about 20°c. Stored seed is best sown as soon as it is received. Do not allow the compost to dry out. Germination usually takes place fairly quickly so long as the seed is of good quality, though it can take 3 - 6 months. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a lightly shaded place in the greenhouse until large enough to plant out, which could be a few years. Plants only flower at intervals of several years and so seed is rarely available. Division in late spring as new growth commences. Take divisions with at least three canes in the clump, trying to cause as little root disturbance to the main plant as possible. Grow them on in light shade in a greenhouse in pots of a high fertility sandy medium. Mist the foliage regularly until plants are established. Plant them out into their permanent positions when a good root system has developed, which can take a year or more[200].

nwatta Requires a good humus rich loam with ample moisture in the growing season[200]. Prefers partial shade, growing well in thin woodland. This species is notably resistant to honey fungus[200]. Plants only flower at intervals of many years. When they do come into flower most of the plants energies are directed into producing seed and consequently the plant is severely weakened. They sometimes die after flowering, but if left alone they will usually recover though they will look very poorly for a few years. If fed with artificial NPK fertilizers at this time the plants are more likely to die[122]. The rhizome is gently running. This species is liable to be mistaken for *Pseudosasa japonica*[200].

burns, insect stings etc and internally to treat digestive disorders[254]. The essential oil is used in aromatherapy. Its keyword is 'Immune system'[210].

propta Seed - sow spring in a greenhouse and only just cover the seed[4]. It usually germinates in 1 - 3 months at 15°c. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in late spring after the last expected frosts. Cuttings of half-ripe wood 7 - 10cm with a heel, July/August in a frame. Usually very east, a high percentage will root within a few weeks[78]. Grow them on in the greenhouse for their first winter and plant them out in late spring after the last expected frosts. Cuttings 7cm with a heel succeed at almost any time of the year[1]. Layering.

nwatta Succeeds in almost any soil so long as it is well-drained and not too acid[1, 200]. Prefers a sunny position in a neutral to alkaline soil[14, 200]. Prefers a light warm dry soil[37]. When grown in rich soils the plants tend to produce more leaves but less essential oils[4]. Very tolerant of salt wind exposure. Established plants are drought tolerant[190]. When growing for maximum essential oil content, the plant must be given a very warm sunny position and will do best in a light sandy soil, the fragrance being especially pronounced in a chalky soil[245]. This species of lavender is cultivated for its essential oil in S. France and England[46, 61]. It is very closely related to *L. angustifolia* but perhaps not so hardy, tolerating temperatures down to about -10°c[11, 200]. Plants are not very long-lived and soon become straggly unless pruned. Any trimming of the plant is best done in spring and should not be done in the autumn since this can encourage new growth that will not be very cold-hardy[200]. A good bee plant[7, 24], also attracting butterflies and moths[30]. A good companion for most plants[54], growing well with cabbages[14].

## 7.2.286 Micromeria chamissonis

Yerba Buena  
6 tlin 9 cyuc 2 kcaak 2 tcan 2 dwat 0.1 m hkuc  
hmimhtut cyutli kyuctup hwicli hyishrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Micromeria chamissonis is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: TeaThe dried leaves, steeped in boiling water, make a palatable mint-flavoured tea[183, 207, 256, 257]. The dried leafy spines are used according to other reports[161, 177].

tcanta EssentialThe leaves have been placed in clothing as a perfume[257]. A dynamic accumulator gathering minerals or nutrients from the soil and storing them in a more bioavailable form - used as fertilizer or to improve mulch.

dwatta Anthelmintic Aphrodisiac Blood purifier Digestive Febrifuge Kidney Sedative TonicThe whole plant is aphrodisiac, blood purifier, mildly digestive, febrifuge, sedative and tonic[207, 256, 257]. An infusion can be used in the treatment of insomnia, colic, upset stomachs, kidney problems, colds and fevers[257]. A decoction of the plant has been used to get rid of pinworms[271]. The decoction has also been used as an aphrodisiac[257]. A poultice of the warm leaves have been applied to the jaw, or the plant held in the mouth, as a treatment for toothache[257].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in early summer. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Division of the rooted prostrate stems in the spring.

nwatta Prefers an open position in a well-drained soil[1]. Succeeds in poor soils[200]. Plants grow best and live longer when grown in an open sunny position and a dry sandy soil[245]. A prostrate plant, the stems forming roots at the leaf axils wherever they come into contact with the soil[245]. The bruised leaves release a most refreshing lemony scent resembling verbenal[245]. *Micromeria chamissonis* (Benth.) Greene is a synonym of *Micromeria douglasii* Benth. *Satureja douglasii* (Benth.) Briq. is a synonym of *Micromeria douglasii* Benth. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.287 Podocarpus lawrencei

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Podocarpus lawrencei is an evergreen Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. It is rather small but has a pleasant slightly sweet flavour with a mucilaginous texture[K]. The fruit is about 6 x 5 mm[200].

tcanta None known  
dwatta None known

propta The seed can be sown at any time of the year in a sandy soil in a warm greenhouse, though it is probably best sown as soon as it is ripe[1]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe terminal shoots, 5 - 10cm long, July/August in a frame[78].

nwatta Prefers a rich moist non-alkaline soil[167]. Grows best in sheltered areas with a humid climate[200]. Plants in this genus are notably resistant to honey fungus[200]. There is some confusion over this species, the Flora of Australia says that it is endemic to Australia[286], whilst our other records say that it is a New Zealand plant[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.288 Lycoris squamigera

Resurrection Lily, Hardy Amaryllis, Magic Lily, Autumn Lycoris, Naked Lady  
6 tlin 10 cyuc 2 kcaak 0 tcan 0 dwat 0.7 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Lycoris squamigera is a BULB growing to 0.7 m (2ft 4in) by 0.2 m (0ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked. It is used as a source of starch[105, 177]. The bulb is 4cm in diameter[200]. Caution is advised, see the notes above on toxicity.

tcanta None known  
dwatta None known

propta The seed is best sown as soon as it is ripe in a greenhouse and should germinate in the spring[200]. Sow the seed thinly so that it does not need to be disturbed for

its first year of growth. Give an occasional liquid feed during the growing season to ensure the plants do not become nutrient deficient. Pot up the small bulbs when the plants become dormant, placing 2 bulbs in each pot. Grow them on for another 2 years in the greenhouse before planting them out when they are dormant. Division of offsets in the dormant season[200].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden, Seashore, Specimen. Requires a deep well-drained sandy soil rich in organic matter in full sun[200]. The bulb should be planted quite shallowly so that it can ripen well after flowering[245]. Hardy to at least -15°C, the leaves are produced in early spring and persist until late summer[200]. Plants need a warm period in late summer in order to ripen the bulbs and induce flowering in the following year[188]. A very ornamental species, each bulb producing a number of flowering stems in mid to late summer[245]. The flowers are very sweetly scented, the scent pervading the whole garden[245]. Plants are attractive to slugs and need to be protected from them[200]. Very sensitive to root disturbance, the bulbs can take some years to become well established[200]. Special Features:Not North American native, Naturalizing, Suitable for cut flowers, Fragrant flowers, Attractive flowers or blooms.

## 7.2.289 Centaurea depressa

Iranian knapweed

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc htut cyutli hqatkyuctcup hwicli hyishrasjlutnyk hpa7tli flatprikhwisslip hpa7tmwatli wfyfkr7t hjonli

drutta Centaurea depressa is a ANNUAL/PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: RootEdible Uses: Root - cooked. An agreeable flavour[2, 105].

tcanta None known dwatta None known

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. The seed can also be sown as soon as it is ripe in the late summer in a greenhouse and planted out in the late spring. Division in autumn. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. This should be done at least once every three years in order to maintain the vigour of the plants. Basal cuttings in spring. Harvest the shoots when they are about 10 - 15cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. A very ornamental plant[1]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.290 Codonopsis ussuriensis

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Codonopsis ussuriensis is a PERENNIAL growing to 0.3 m (1ft) by 3 m (9ft 10in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to October, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable

pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: RootEdible Uses: Root - raw or cooked[46, 61, 105]. Plants produce a stout, globose tuber[275]. The ones we grew were quite thin, but they have a reasonable flavour with a slight sweetness[K].

tcanta None known dwatta None known propta Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to avoid the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

nwatta Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. Only succeeds in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Dormant plants are hardy to about -20°C[187]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. This plant is considered to be a part of *C. lanceolata* by many botanists[200]. Plants resent root disturbance and should be planted out into their permanent position as soon as possible[164]. Plants are very susceptible to the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K].

## 7.2.291 Passiflora x colvillii

Passion Flower

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwiv hpa7tmwatli xre7t hjonli

drutta Passiflora x colvillii is an evergreen Climber growing to 10 m (32ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to September, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Fruit - raw or cooked[262].

tcanta None known dwatta None known

propta Pre-soak the seed for 12 hours in warm water and then sow late winter or early spring in a warm greenhouse. If sown in January and grown on fast it can flower and fruit in its first year[88]. The seed germinates in 1 - 12 months at 20°C. Prick out the seedlings into individual pots when they are large enough to handle. If you are intending to grow the plants outdoors, it is probably best to keep them in the greenhouse for their first winter and plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Mulch the roots well in late autumn to protect them from the cold. This species is a hybrid and, as such, will not breed true from seed. Cuttings of young shoots, 15cm with a heel, in spring[1]. Leaf bud cuttings in spring. Cuttings of fully mature wood in early summer. Takes 3 months. High percentage[3].

nwatta Requires a well-drained soil with plenty of moisture in the growing season, otherwise it is not fussy[1, 200]. Dislikes highly alkaline soils[202]. Hardy to about -15°C, if plants are cut down to the ground by frost they can regenerate from the base[200]. It is best to apply a good mulch to the roots each winter in order to protect them from the cold[262]. Very fast growing[111]. Roots of outdoor grown plants should be restricted to encourage fruiting[1]. Plants

Plants are often slow to get established. Plants can be susceptible to attacks by caterpillars[182] and are often damaged during the flowering season[11]. They are also a host of the sugar beet fly[49]. This species is notably resistant to honey fungus[200]. Special Features: Not North American native, Naturalizing, Inconspicuous flowers or blooms.

## 7.2.359 Cocculus orbiculatus

Queen coralbead

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwiv hpa7tmwatli hjonli

drutta Cocculus orbiculatus is a deciduous Climber growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in August, and the seeds ripen in October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Leaves - cooked. An emergency food, it is used when all else fails[177]. One report says that the root might be edible[177].

tcanta Basketry InsecticideThe bleached tendrils are used as an ornamental infill in basket making[46, 61]. The plant contains cocculoidine which has insecticidal activity[218].

dwatta Anodyne Antiasthmatic Antiphlogistic Antirheumatic Carminative Depurative Diuretic VermifugeThe root is anodyne, antiphlogistic, antirheumatic, carminative, depurative, diuretic and vermifuge[147, 176, 218]. It is used in the treatment of rheumatic arthritis, oedema and oliguria[176]. It has also shown antibacterial and anti-amoebic activity[176]. A decoction of the stems is used in the treatment of asthma, bronchitis and paralysis[218].

propta Seed - we have no details for this species but suggest sowing the seed as soon as it is ripe in a greenhouse. Sow stored seed as soon as possible in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out in late spring or early summer, after the last expected frosts. Root cuttings in December in a greenhouse[200]. Division in the dormant season. Cuttings of half-ripe wood, July/August in a frame[200].

nwatta Easily cultivated in an ordinary garden soil[1], it prefers a well-drained moisture retentive fertile soil in full sun or semi-shade[200]. Plants only fruit well when grown in full sun[219]. This species is hardy to about -10°C[200]. Plants climb by means of twining around supports[219]. They do not normally require pruning[219]. Closely related to *C. carolinus*[200].

## 7.2.360 Alangium platanifolium

Alangium

6 tin 10 cyuc 1 kcaak 0 tcan 1 dwat 3 m hkuc htut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwiv hpa7tmwatli xre7t hjonli

drutta Alangium platanifolium is a deciduous Shrub growing to 3 m (9ft) by 2 m (6ft). See above for USDA hardiness. It is hardy to UK zone 8. It is in flower from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta InsecticideThe leaves and the bark of the root are used as an insecticide[178]. The leaves and stem bark according to another report[218].

dwatta AntirheumaticThe root is used in the treatment of rheumatism and other bone diseases[218].

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse in the spring. When

large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out in early summer and consider giving them some protection from the cold for their first winter outdoors. Cuttings of half-ripe wood, July/August in sand in a frame[200]. Users feedback: I collected the seeds in late summer, stored them at a dark and dry location and followed a normal stratification procedure from November till January (November and January at around 2°C, December at around -12°C, all in my fridge). Germination appears to start at the earliest after three weeks, how long it usually takes I will know in a couple of weeks (it's just one early bird that broke through the surface today).

Luckily, no trickery is required: it's sufficient to clean them up, soak them in water before and after stratification and pop them into the moist soil. OW

nwatta Succeeds in any moderately fertile well-drained soil[200]. Requires full sun and a sheltered position[182, 200]. A fairly hardy plant[1], but it does not succeed outdoors at Kew, the soft pity shoots being cut back by winter cold[11]. It grows well in Gloucestershire[11, 182]. This species is closely related to *A. chinense*[200].

## 7.2.361 Artemisia annua

Qing Hao, Sweet sagewort

6 tin 9 cyuc 1 kcaak 2 tcan 4 dwat 3 m hkuc hmimhtut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikwiv hpa7tmwatli xre7t hjonli

drutta Artemisia annua is a ANNUAL growing to 3 m (9ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: CondimentAn essential oil in the leaves is used as a flavouring in spirits such as vermouth[269].

tcanta Essential Herbicide MiscellanyThe plant is used in China as a medium for growing Aspergillus which is used in brewing wine. The substances mentioned above in the medicinal uses, used in the treatment of malaria, also show marked herbicidal activity[222]. The plant yields 0.3% essential oil[240]. This has an agreeable, refreshing and slightly balsamic odour and has been used in perfumery[240].

dwatta Antibacterial Antiperiodic Antiseptic Carminative Digestive Febrifuge Malaria MiscellanyQing Ho, better known in the West as sweet wormwood, is a traditional Chinese herbal medicine. An aromatic anti-bacterial plant, recent research has shown that it destroys malarial parasites, lowers fever and checks bleeding[238, 254, 279]. It is often used in the Tropics as an affordable and effective anti-malarial[254]. The leaves are antiperiodic, antiseptic, digestive, febrifuge[176, 178]. An infusion of the leaves is used internally to treat fevers, colds, diarrhoea etc[222, 254]. Externally, the leaves are poulticed onto nose bleeds, boils and abscesses[222, 238]. The leaves are harvested in the summer, before the plant comes into flower, and are dried for later use[254]. The plant contains arteeminin, this substance has proved to be a dramatically effective anti-malarial against multi-drug resistant Plasmodium spp[218, 238, 254, 269]. Clinical trials have shown it to be 90% effective and more successful than standard drugs[254]. In a trial of 2000 patients, all were cured of the disease[218]. The seeds are used in the treatment of flatulence, indigestion and night sweats[222].

propta Seed - sow spring in a cold frame and plant out in late spring or early summer. Alternatively, the seed can be sown late spring in situ.

nwatta An easily grown plant, succeeding in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. A fast-growing annual plant, it is tall but neat in habit with a handsome fragrant foliage and is useful for filling gaps at the back of a border[238]. It has become a weed of waste places in many areas of the world[43]. The

(loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit Oil OilEdible Uses: Oil OilThis species has the same uses as the closely related *C. sanguinea*[74]. These uses are listed below. Fruit - raw or cooked[105]. A bitter flavour, it can also have an emetic effect on the body[1, 7, 11]. It is not worthwhile[115]. The fruit is about 5mm in diameter[200]. An oil is obtained from the seed[2], it is edible when refined[75].

**tcanta Basketry Charcoal Dye Fuel Hedge Hedge Oil Wood**This species has the same uses as the closely related *C. sanguinea*[74]. These uses are listed below:- The seed contains 45% of a non-drying oil[74], it is used in soap making and lighting[7, 13, 100, 115, 177]. A non-drying oil is also obtained from the pericarp, it is used for lighting[74]. The pericarp contains 19 - 35% oil[74]. A greenish-blue dye is obtained from the fruit[13, 74]. The young stems are very flexible and are used in basketry[7, 13, 74, 100]. Wood - tough, hard. Used for small items such as tool handles, turnery etc[11, 61, 115]. A good quality charcoal is obtained from the wood[115], the wood also makes an excellent fuel[115].

**dwatta None known**  
**propta Seed** - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

**nwatta** An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188]. This species is closely related to *C. sanguinea*[11]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.357 *Cornus poliophylla*

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 4 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Cornus poliophylla* is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** FruitEdible Uses: The following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Fruit - raw or cooked[2, 105, 146, 158, 200, 218]. The fruit is about 6mm in diameter[200].

**tcanta Wood**The following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Wood - hard, close grained, warps badly[158]. It makes a good charcoal[146, 158].

**dwatta Anodyne Astringent Dysentery Tonic**The following notes are for *C. macrophylla*, they quite probably also apply to this closely related species[K]. Anodyne, astringent, tonic[178]. The wood is anodyne and a uterosecative[218]. The stem bark is used in the treatment of dysentery[218].

**propta Seed** - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Stored seed should be cold stratified for 3 - 4 months and sown as early

as possible in the year[164]. Scarification may also help as may a period of warm stratification before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

**nwatta** An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188]. This species is closely related to *C. monbeigii*[1, 200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.358 *Euonymus japonicus*

Japanese Spindle Tree, Box-leaf Euonymus, Evergreen Euonymus, Japanese Euonymus

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 4.5 m hkuc hmimhtut cyutli kyucutp hwicli hrasljutnyikfrp hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Euonymus japonicus* is an evergreen Shrub growing to 4.5 m (14ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

**kcakta Edible Parts:** LeavesEdible Uses: ColouringY-oung leaves - boiled[2, 177, 183]. The old leaves are powdered and used to colour food[105, 177, 183]. These reports should be treated with some caution due to the report of toxicity - see above.

**tcanta Hedge Hedge LatexRoots** and stems yield up to 7% gutta-percha, a non elastic rubber used as an electrical insulator and in making plastics etc[61, 74, 103]. Can be grown as a hedge, it is very tolerant of trimming and succeeds in severe maritime exposure[11, 75, 200].

**dwatta Antirheumatic Diuretic Tonic Women's complaints**The stem bark is antirheumatic, diuretic and tonic[218]. The leaf is used in cases of difficult delivery[218].

**propta Seed** - best sown as soon as it is ripe in a cold frame[121]. Stored seed requires 3 months cold stratification, so should be sown as early in the year as possible in a cold frame[113]. Seed can take 18 months to germinate[74]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 5 - 7cm long taken at a node or with a heel, July/August in a frame. Very easy[200]. Cuttings of mature wood, October in a frame[78, 113]. Cuttings will root readily at any time of the year if given bottom heat[1]. Root cuttings in winter.

**nwatta Landscape Uses:**Border, Container, Foundation, Hedge, Massing, Screen, Specimen, Woodland garden. Thriving in almost any soil, including chalk and sandy soils, it is particularly suited to dry shaded areas[200]. Grows well in heavy clay soils. Shade tolerant but does not fruit well in such a position[11]. Prefers a well-drained loamy soil[11]. Plants are very tolerant of maritime exposure, succeeding even when grown on the sea shore[166], but they can be killed by cold drying winds[75, 184]. A very ornamental plant[1], there are a number of named varieties[184]. It is only hardy in S. England[11] tolerating temperatures down to about -10°C[184]. Plants are more likely to succumb to the cold if they are regularly trimmed (this exposes young growth to the cold), this regular trimming also leads to mildew especially when plants are growing in very dry ground[182]. The Japanese spindle tree is cultivated in Russia and Spain for the latex contained in the root. It is best grown in a dry soil and an open position when being grown for its latex[61, 74].

produce tendrils and climb by attaching these to other plants. If fruit is required, especially when the plant is grown indoors, it is best to hand pollinate using pollen from a flower that has been open for 12 hours to pollinate a newly opened flower before midday[88, 200]. The flowers open in sunny weather and do not open on dull cloudy days[219]. Plants are very tolerant of pruning and can be cut back to ground level if required to rejuvenate the plant[202]. Any pruning is best carried out in the spring[219]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.292 *Quercus myrsinaefolia*

6 tin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatprikliw hpa7tmwatli hjonli

**drutta** *Quercus myrsinaefolia* is an evergreen Tree growing to 15 m (49ft) by 8 m (26ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower in June, and the seeds ripen in November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta Edible Parts:** SeedEdible Uses: CoffeeSeed - cooked[105, 177]. The seed is up to 25mm long[200], it can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute.

**tcanta Repellent Tannin WoodA** mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrescences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4].

**dwatta Astringent Dysentery**Any galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

**propta Seed** - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

**nwatta** Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Lime tolerant[188]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The seed ripens in its first year[200]. Plants grown under this name in Britain are often *Q. bambusifolia*, *Q. glauca*, *Q. salicina* or *Q. stenophylla*[200]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.293 *Cyperus longus*

Galینگale  
6 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.2 m hkuc hwit cyutli tcuphja7nh56s hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Cyperus longus* is an evergreen Perennial growing to 1.2 m (4ft) by 2 m (6ft 7in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil and can grow in water.

**kcakta Edible Parts:** RootEdible Uses: CondimentTuber - used as a spice in soups, pies and sweets[5, 183].

**tcanta Basketry Essential Paper Weaving**The leaves are used in basketry and for weaving hats, matting etc[100]. The root and stem have the scent of violets and are used in perfumery[4, 46, 61, 245]. The aroma becomes more pronounced when the root has been dried and left to age[245]. A fibre obtained from the plant is used in paper making[100].

**dwatta Aromatic Tonic**The root is an aromatic tonic[4]. It was at one time considered to be a good stomachic and useful in the first stages of dropsy, but it has now fallen into disuse[4, 238].

**propta Seed** - surface sow in the spring and keep the compost moist[164]. The seed usually germinates in 2 - 6 weeks at 18°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow on for their first winter in a greenhouse and plant them out in late spring after the last expected frosts. Division in spring or autumn. Division is simple at almost any time of the year, so long as the roots are not allowed to become dry. Plant them out straight into their permanent positions.

**nwatta** Prefers a moist sandy loam[95, 117]. Succeeds in any good garden soil so long as it does not dry out[162], it also grows well in up to 30cm of water[200]. Plants are hardy to about -15°C[200]. A very ornamental plant[1], though it can spread freely at the roots when well-suit[233]. Galینگale was one of the favourite spices of the medieval kitchen and was an ingredient of 'pokerounce', a kind of medieval cinnamon toast[183]. It is rarely used at present. Both the root and the stem have a sweet moss-like perfume, resembling that of the violet but not so pure. The aroma becomes more fragrant with age[245].

## 7.2.294 *Pulmonaria officinalis*

Lungwort, Common lungwort, Jerusalem Sage, Jerusalem Cowslip

6 tin 9 cyuc 2 kcaak 0 tcan 3 dwat 0.3 m hkuc pcmhmm cyutli hgattcup hwicli hrasljutnyikfrp hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

**drutta** *Pulmonaria officinalis* is an evergreen Perennial growing to 0.3 m (1ft) by 0.3 m (1ft in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in leaf all year, in flower from March to May, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil and can tolerate drought.

**kcakta Edible Parts:** LeavesEdible Uses: Leaves - raw or cooked[2, 7, 8, 9, 105]. They can be added to salads or used as a potherb[183]. A fairly bland flavour but the leaves are low in fibre and make an acceptable addition to mixed salads, though their mucilaginous and slightly hairy texture make them less acceptable when eaten on their own[K]. The young leaves make a palatable cooked vegetable[244], though we have found the texture to be somewhat slimy[K]. The plant is an ingredient of the drink Vermouth[244].

**tcanta** A tolerant and slow growing ground cover plant for open woodland and border edges[197, 200]. Plants should be spaced about 50cm apart each way[208].

**dwatta Astringent Demulcent Diaphoretic Diuretic Emollient Expectorant Homeopathy Ophthalmic Resol-**

ventLungwort has a high mucilage content and this makes it useful in the treatment of chest conditions, being of particular benefit in cases of chronic bronchitis[254]. It combines well with other herbs such as coltsfoot (Tussilago farfara) in the treatment of chronic coughs including whooping cough and can also be taken to treat asthma[254]. The leaves and flowering shoots are astringent, demulcent, diaphoretic, diuretic, emollient, mildly expectorant and resolvent[4, 7, 9, 21, 165]. They are often used for their healing effect in pulmonary complaints[4] and their mucilaginous nature makes them beneficial in treating sore throats[244]. The leaves can also be used externally to stop bleeding[254]. They are harvested in the spring and dried for later use[7]. A distilled water made from the plant is an effective eyewash for tired eyes[7]. A homeopathic remedy is made from the plant[9]. It is used in the treatment of bronchitis, coughs and diarrhoea[4].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn or after flowering in early summer if the soil is not too dry[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Landscape Uses:Border, Container, Ground cover, Massing, Specimen, Woodland garden. Grows well in any moderately good soil including heavy clay soils[1, 31]. Prefers full to part shade in a moist humus rich soil[200]. Succeeds in the sunless shade of buildings[200]. Plants growing in shady positions tolerate drought if the soil is rich in humus[190]. The leaves tend to wilt in hot weather when the plant is grown in full sun[190]. Hardy to about -20°C[187]. Members of this genus are rarely if ever troubled by browsing deer and rabbits[233]. A valuable early nectar source for bees[200]. There are several named forms, selected for their ornamental value[233]. Hybridizes freely with other members of this genus[200]. Special Features: Not North American native, Extended bloom season in Zones 9A and above.

## 7.2.295 Cistus ladanifer

Labdanum, Common gum cistus

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 1.5 m hkuc hmit cyuti hgatkuyctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Cistus ladanifer is an evergreen Shrub growing to 1.5 m (5ft) by 1 m (3ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in June, and the seeds ripen in August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Manna SeedEdible Uses: Conditment GumSeed - ground into a powder and used with cereal flours in making cakes and breads[177, 183]. An oleo-resin obtained from the leaves and stems is eaten raw or used as a commercial food flavouring in baked goods, ice cream, chewing gum etc2, 105, 177, 183, 238]. The plant is said to yield a sweet manna[183].This report is probably referring to the oleo-resin mentioned above[K].

tcanta Gum ResinThe glandular hairs on the leaves yield the oleo-resin 'ladanum', used medicinally and in soaps, perfumery, fumigation etc[4, 11, 46, 61, 64, 89, 100]. This resin is an acceptable substitute for ambergris (which is obtained from the sperm whale) and so is important in perfume manufacture[238]. The resin is collected by dragging a type of rake through the plant, the resin adhering to the teeth of the rake, or by boiling the twigs and skimming off the resin[64, 89]. Most resin is produced at the hottest time of the year[46].

dwatta Antibiotic Emmenagogue Expectorant StimulantLabdanum is an aromatic, expectorant, stimulant herb that controls bleeding and has antibiotic effects[4, 238]. It is used internally in the treatment of catarrh and diarrhoea[238] and as an emmenagogue[4]. The leaves are harvested in late spring and early summer and can be dried for later use, or the resin extracted from them[238].

propta Seed - gather when ripe and store dry[78]. Surface sow in late winter in a greenhouse[164]. The seed usually germinates in 1 - 4 weeks at 20°C[164]. Prick out the seedlings as soon as they are large enough to handle into individual pots. Grow them on in the greenhouse for their first winter and plant them out in the following spring or early summer, after the last expected frosts[164]. The seed stores for at least 3 years[K]. Cuttings of softish to half-ripe wood, 8cm long with a heel or at a node, June/August in a frame. Roots are formed within 3 weeks[78]. High percentage[78]. Cuttings of almost mature wood, 8 - 12cm with a heel or at a node, September/October in a frame. High percentage[78]. Lift and pot up in the spring, plant out when a good root system has formed[78]. Layering in spring.

nwatta Industrial Crop: Hydrocarbon Management: Coppice Regional CropRequires a sunny position in a well-drained light sandy soil[11, 182], growing well in poor soils[238]. Withstands drought once it is established[11, 190]. Plants are fairly wind resistant[166, K], tolerating maritime exposure[188]. Resents root disturbance[11]. Plants are hardy to about -10c[184], but they require protection in severe winters[11]. Plants are somewhat hardier when grown in poor soils[182]. Individual flowers only last one day but there is a long succession of them[11, 200]. Labdanum dislikes pruning, especially as it gets older and so any formative work should be restricted to removing dead, straggly or damaged growths[238]. The plant also resents root disturbance[200]. Plants should be pot grown and then planted out in their final positions whilst still small. Sometimes cultivated for its gum, which is known as 'Labdanum', this is exuded in such quantity in hot weather that the plant becomes very sticky[4, 61]. The leaves have glandular hairs which produce an aromatic gum. The sweet balsamic smell is most apparent in the summer in the early morning[245]. A very ornamental plant, it is very free-flowering and fast growing[49]. There are a number of named forms developed for their ornamental value[182]. An excellent nurse plant for sheltering young seedlings[49]. This species is notably resistant to honey fungus[88, 200]. The flowers are very attractive to bees[108]. Hybridizes freely with other members of this genus[200].

## 7.2.296 Sorbus species

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Sorbus species is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Fruit - raw or cooked[K]. Up to 15mm in diameter[11].

tcanta None known dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring. This is a hybrid and so is unlikely to breed true from seed.

Tonic VermifugeAlthough it has been used medicinally in the past as a sedative and to treat syphilis, box is very rarely used in modern herbalism[268]. The leaves and the bark are alterative, antirheumatic, cathartic, cholagogue, diaphoretic, febrifuge, oxytotic and vermifuge[4, 7, 9, 21, 178]. The leaves have been used as a quinine substitute in the treatment of malaria[7]. The leaves are harvested in the spring, before the plant comes into flower, and they are dried for later use[238]. The bark can be harvested at any time of the year and is dried for use in decoctions[238]. Use this remedy with caution and preferably only under the supervision of a qualified practitioner. The plant has not been fully tested for its toxic side effects[7, 21]. The wood is diaphoretic, in full dose it is narcotic and sedative, in overdose it is convulsant and emetico-cathartic[4]. A tincture of the wood has been used as a bitter tonic and antiperiodic, it has also had a reputation for curing leprosy[4]. A volatile oil distilled from the wood has been prescribed in cases of epilepsy[4]. An essential oil obtained from the plant is used in dentistry[7]. A homeopathic remedy is made from the plant[7]. It is extensively used in the treatment of rheumatism[7].

propta Seed - stratification is not necessary but can lead to more regular germination[113]. The seed is best sown in a cold frame as soon as it is ripe[138]. Sow stored seed as early in the year as possible in a cold frame. It usually germinates in 1 - 3 months at 15°C but stored seed can take longer[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of short side shoots with a heel, September in a frame[200]. High percentage[78]. Rather slow to root[K]. Nodal cuttings in spring in a frame. Fairly easy[200].

nwatta Landscape Uses:Container, Foundation, Screen, Woodland garden. Succeeds in almost any soil that is well-drained[11, 200], preferring light shade and chalky soils[9, 11, 28, 31]. Succeeds in dry shade[188]. Tolerates a pH range from 5.5 to 7.4[200]. A very hardy plant, tolerating temperatures down to at least -23°C, though it prefers milder winters[238]. A very polymorphic species, it is a very ornamental but slow growing plant[11] and there are many named varieties developed for their ornamental value[182]. This species is notably resistant to honey fungus[88, 200]. A good bee plant[108]. Plants are very tolerant of being trimmed, they can be cut right back to the base if required and will usually resprout freely[11, 29]. The foliage is pungently scented, especially when wet[245]. Special Features: Attractive foliage, Not North American native, All or parts of this plant are poisonous, Inconspicuous flowers or blooms.

## 7.2.354 Clematis apiifolia

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 5 m hkuc hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Clematis apiifolia is a deciduous Climber growing to 5 m (16ft) by 5 m (16ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung shoots - cooked and used as a vegetable[105, 177, 183]. Caution is advised, see the notes above on toxicity. The dried leaves are a tea substitute[105, 177]. The roasted leaves are used according to another report[183].

tcanta None known dwatta Carminative Digestive DysenteryAn infusion of the stems is used in the treatment of colic, dysentery, dyspepsia and sweating[218]. The plant is carminative and digestive[218]. It is also used in the treatment of dysentery[218].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as pos-

sible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade and its shoots growing up to the light[164]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. A twining plant[182], it is fast-growing and is possibly best in the wild garden[202]. The leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.355 Weigela hortensis

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc hmimhtut cyuti tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Weigela hortensis is a deciduous Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: TeaYoung leaves - cooked[105, 177]. A famine food, they are only used when all else fails. A tea is made from the leaves[177].

tcanta None known dwatta None known

propta Seed - we have no information for this species but suggest sowing the seed in a cold frame as soon as it is ripe if this is possible, otherwise in late winter or early spring. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant them out in late spring or early summer. Softwood basal cuttings, 10 - 12cm long, in a sandy soil in a cold frame in early summer[200]. Cuttings of half-ripe wood, 8 - 10 cm with a heel, July/August in a frame[200]. Cuttings of mature wood of the current seasons growth. 20 cm long, November in a sheltered outdoor nursery bed[200].

nwatta An easily grown plant, succeeding in most fertile soils[11, 200]. Prefers a moist well-drained soil in sun or partial shade[200]. Tolerates atmospheric pollution[200]. Plants are very floriferous and can exhaust themselves, literally flowering themselves to death. The flowers are borne in the leaf nodes of the previous years growth and any pruning is therefore best done as soon as the plant has finished flowering[182]. The flowers have a soft sweet perfume[245]. Closely related to *W. japonica*[11]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.356 Cornus australis

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 4 m hkuc hmimhtut cyuti tcup hwicli hrasjlutnyikrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Cornus australis is a deciduous Shrub growing to 4 m (13ft 1in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium



the plant for 2 - 3 years, falling just before the appearance of new leaves in the spring[82]. Flowers are produced on the current year's growth[29]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.351 Tamarix anglica

English Tree

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 5 m hkuc  
hmtut cyutli kyuctcup hwicli hrasljutnykfrp hpa7tli flatprklwissliphom hpa7tmwatli xre7t hjonli

drutta Tamarix anglica is a deciduous Shrub growing to 5 m (16ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: MannaEdible Uses: A manna is produced by the plants in response to insect damage to the stems[2, 105]. It is sweet and mucilaginous[105].

tcanta Fuel Hedge Hedge Soil stabilization WoodVery tolerant of maritime exposure, it makes a good shelter hedge in coastal gardens[7, 11, 49, 75]. Dislikes being trimmed[75]. The extensive root system of this plant makes it suitable for use in erosion control in sandy soils[149]. Wood - fairly hard, not strong, close grained, takes a high polish. Used for general construction, poles, turnery[61, 149]. It makes a good fuel, burning well even when green due to the wax content of the wood[74].

dwatta Astringent DiureticAstringent, diuretic[7].

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy[200]. Cuttings of mature wood of the current seasons growth, 15 - 25cm long, planted outdoors in late autumn in a nursery bed or straight into their permanent position. High percentage[11, 200].

nwatta An easily grown plant, succeeding in most soils and tolerant of saline conditions[11]. Grows well in heavy clay soils as well as in sands and even shingle[182]. Usually found near the coast, it succeeds inland if given a fairly good deep loam and a sunny position[11, 200]. Tolerant of maritime winds and dry soils when grown near the coast[11], plants require a moister soil and shelter from cold drying winds when they are grown inland in non-saline soils because they use the soil salts that are found in saline soils to help them reduce transpiration[200]. Growth can be restricted by cutting back the plants in spring, hedges are also best trimmed at this time[188]. This species is very closely related to *T. gallica* and is considered to be no more than a part of that species by many botanists[11, 200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.352 Ilex crenata

Japanese Holly, Box Leaved Holly

6 tlin 8 cyuc 1 kcaak 0 tcan 0 dwat 5 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex crenata is an evergreen Shrub growing to 5 m (16ft) by 3 m (9ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from May to June, and the seeds ripen from September to October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and

basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[105, 177]. No further details are given, but some caution is advised[K].The fruit is about 5mm in diameter[200].

tcanta Hedge HedgeVery amenable to trimming, this species is often grown as a hedge in N. America and Japan. It can also be used in topiary[182].

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Landscape Uses:Border, Espalier, Foundation, Hedge, Massing, Seashore, Superior hedge. Succeeds in most soils so long as they are not water-logged[200]. Prefers a moist loamy soil[1]. Fairly slow growing. Plants are hardy to about -20°C[184]. A number of named varieties have been selected for their ornamental value[182]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Any transplanting is best done in May or, preferably, in September. Dioecious. Male and female plants must be grown if fruit and seed is required. Special Features:Not North American native, Inconspicuous flowers or blooms.

## 7.2.353 Buxus sempervirens

Box, Common box, American Boxwood

6 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasljutnykfrp hpa7tli flatprklwissliphpa7tmwatli hjonli

drutta Buxus sempervirens is an evergreen Shrub growing to 5 m (16ft) by 5 m (16ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in leaf all year, in flower from April to May, and the seeds ripen in September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe leaves have been used in France as a substitute for hops (*Humulus lupulus*) in making beer[7]. They cannot be very wholesome, and would probably prove to be injurious[2].

tcanta Dye Hedge Hedge WoodBox makes an excellent hedge from 45cm to 4.5 metres tall according to the variety grown[11, 29]. It is quite slow growing but very tolerant of cutting and is often used in topiary, where the hedge is trimmed into different forms for ornamental effect[182]. The leaves and sawdust, boiled in lye, have been used to dye hair an auburn colour[4]. Wood - hard, close grained, heavy. Although the wood is rather small, it is highly valued on account of its hardness - it is twice as hard as oak (*Quercus* species)[4, 268]. It is used for engraving, printing blocks, bowls, combs etc[4, 7, 11, 46, 100, 115, 178]. The root especially is much liked by turners and cabinet makers[7].

dwatta Alternative Antiperiodic Antirheumatic Cathartic Cholagogue Diaphoretic Epilepsy Febrifuge Homeopathy Leprosy Malaria Narcotic Odontalgic Oxytoxic Sedative

nwatta This record is to cover a series of hybrids of garden origin that belong to the whitebeam section of the genus but have not been placed in a distinct species. The following notes are based on the general needs of this group of plants[K]. Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. A very ornamental tree[11]. Plants are apt to die back without any warning[11].

## 7.2.297 Campanula medium

Canterbury Bells, Cup and Saucer, Canterbury Bells

6 tlin 8 cyuc 2 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasljut hpa7tli prklwissliphpa7tmwatli fyifxre7t hjonli

drutta Campanula medium is an evergreen Biennial growing to 1.2 m (4ft) by 0.3 m (1ft in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Young shoots - raw or cooked[177]. Root - cooked[177].

tcanta DyeGreen and pale blue dyes are obtained from the flowers[168].

dwatta None known

propta Seed - best sown in an outdoor seedbed in May, the seedlings are transplanted when large enough and then placed in their final positions in the autumn[221]. The seed usually germinates in 2 - 4 weeks at 18°C[138].

nwatta Landscape Uses: Border, Container, Ground cover. Succeeds in most fertile well-drained soils[233], though it prefers a moist but well-drained rich sandy loam and a neutral or alkaline soil in sun or partial shade[1, 200]. A very ornamental plant, it is often grown in the flower garden and there are many named varieties[17]. The species in this genus do not often hybridize and so seed can generally be relied upon to come true[221]. The plants are self-fertile[221]. Plants usually self-sow in British gardens[221]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Not North American native, Suitable for cut flowers.

## 7.2.298 Mimulus luteus

Monkey Musk, Yellow monkey-flower

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasljutnykfrp hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Mimulus luteus is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[105, 257]. Eaten as greens[257].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse and only lightly cover the seed[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can also be sown in situ in late spring after the last expected frosts[200]. Division in spring[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings of softwood, 5cm long in spring or summer[200].

nwatta Prefers rather moist places such as damp borders, margins of streams and boggy spots[1]. Grows well in heavy clay soils. Thrives in full sun so long as the soil does not dry out[200]. Hardy to about -20°C[187]. There is some confusion over the naming of this plant, the entry on edibility may refer to *M. guttatus*, which is closely related to this species[161, 200]. Hybridizes with *M. guttatus*[187].

## 7.2.299 Scirpus validus creber

Soft-Stem Bulrush

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Scirpus validus creber is a PERENNIAL growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves Pollen Root SeedEdible Uses: Root - raw or cooked[159, 161, 172, 183]. Rich in starch. The bruised young roots, when boiled in water, furnish a sweet syrup[183]. The rhizomes are 3 - 10mm in diameter[270]. Young shoots - cooked[55, 62, 85, 183]. The tender base of the stem is eaten raw in salads[183]. The pollen is used in soups or mixed with flour and used in making bread[177, 183]. It is rich in protein. Seed[62, 85, 159, 183]. No further details are given but it is probably ground into a powder and used in making bread etc. Small and rather fiddly to harvest and utilize.

tcanta Basketry WeavingThe stems are used in weaving and basket making[189, 257]. They are used to make good quality mats for use on the floor, for sleeping on and for making temporary partitions[257]. The stems are pulled off the plant rather than cut to ensure the maximum length of stem[257].

dwatta Astringent DiureticThe root is astringent and diuretic[152].

propta Seed - sow in a cold frame as soon as it is ripe in a pot standing in 3cm of water. Only just cover the seed with soil[200]. The seed usually germinates fairly quickly. Prick out the plants when large enough to handle and plant out in their permanent positions in early summer. Division in spring. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta We have very little information on this species and do not know if it will be hardy in Britain. However, judging by its native range, it is likely to succeed outdoors at least in the milder areas of the country. The following notes are based on the general needs of the genus. This species may be no more than a synonym for *Schoenoplectus tabernaemontani*[270]. Succeeds in any wet to moisture retentive ground, pond margins and shallow water in full sun or shade[200].

## 7.2.300 Viburnum erosum

Viburnum

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyk hpa7tli flatprklwis hpa7tmwatli dyatxre7t hjonli

drutta Viburnum erosum is a deciduous Shrub growing to 1.8 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 177]. The ovoid fruit is about 8mm long and contains a single large seed[200].

tcanta None known

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe. Germination can be slow, sometimes taking more than 18 months. If the seed is harvested 'green' (when it has fully developed but before it has fully ripened) and sown immediately in a cold frame, it should germinate in the spring[80]. Stored seed will require 2 months warm then 3 months cold stratification and can still take 18 months to germinate[113]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse. Plant out into their permanent positions in late spring or early summer of the following year. Cuttings of soft-wood, early summer in a frame[200]. Pot up into individual pots once they start to root and plant them out in late spring or early summer of the following year. Cuttings of half-ripe wood, 5 - 8 cm long with a heel if possible, July/August in a frame[78, 113]. Plant them into individual pots as soon as they start to root. These cuttings can be difficult to overwinter, it is best to keep them in a greenhouse or cold frame until the following spring before planting them out[113]. Cuttings of mature wood, winter in a frame. They should root in early spring - pot them up when large enough to handle and plant them out in the summer if sufficient new growth is made, otherwise keep them in a cold frame for the next winter and then plant them out in the spring. Layering of current seasons growth in July/August. Takes 15 months[78].

nwatta Landscape Uses:Border, Foundation, Massing, Specimen. An easily grown plant, it succeeds in most soils but is ill-adapted for poor soils and for dry situations[1]. It prefers a deep rich loamy soil in sun or semi-shade[11, 200]. Best if given shade from the early morning sun in spring[200]. This species is perhaps not perfectly hardy in Britain[11]. Another report says that it succeeds in climatic zone 6, which means that it should be hardy in almost all of Britain[200]. Plants are self-incompatible and need to grow close to a genetically distinct plant in the same species in order to produce fruit and fertile seed[11, 200]. Closely related to *V. ichangense*[1]. Special Features: Not North American native, Attractive flowers or blooms.

## 7.2.301 *Cardiocrinum cordatum*

6 tin 9 cyuc 2 kcaak 0 tcan 0 dwat 1.8 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Cardiocrinum cordatum* is a BULB growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: An edible starch is obtained from the bulb[46, 61, 105]. Young leaves - cooked. This use will considerably weaken the plant and is not to be recommended in normal situations[46, 61].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame in the autumn. The plant has delayed epigeal germination and will often germinate in the spring but can take up to 2 years especially if the seed is stored prior to being sown[134]. An alternative is to mix the seed with some moist leafmould and seal it in a plastic bag. Keep this at a temperature of 20°C for 3 weeks then pot up any seed that germinates and place the rest in a fridge for 4 - 5 weeks at 3 - 5°C before sowing in a warm place[138]. Seedlings should be grown on in pots in a shaded position in a cold frame or greenhouse for 3 - 4 years before planting them out in their permanent positions[138]. Bulblets are obtained from the base of the old plant after flowering. Pot up and plant out when well established.

nwatta Prefers a moist well-drained position in shade and a soil that is rich in leafmould[47, 200]. Requires a deep, very fertile humus-laden soil[233]. Prefers growing in woodland conditions[42, 200]. The dormant plant is in general hardy to about -10°C but it comes into growth very early in the year, sometimes in February, and the young growth is

susceptible to frost damage[90, 200]. A monocarpic plant, the bulb takes about 7 years to reach flowering size but then dies after flowering. However, it produces a number of new bulblets at the base and can be propagated by these[47, 200]. These bulblets take 3 - 5 years to flower[200]. The flowers are sweetly scented[245]. When planting, only just cover the bulb with leafmould[47]. The bulb is very attractive to slugs, mice and voles and may require protection[200]. Plants seem to be immune to the predations of rabbits[233].

## 7.2.302 *Ehretia acuminata*

Koda Tree

6 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 9 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ehretia acuminata* is a deciduous Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: FruitEdible Uses: Fruit - raw[105, 144, 146, 158, 177]. About the size of a pea, it is insipidly sweet when fully ripe[2, 183]. The fruit is about 4mm in diameter[200]. The unripe fruit is sometimes used as a pickle[2, 183].

tcanta WoodWood - light, tough, soft and easily worked. Used for carrying poles[46, 61, 158].

dwatta FebrifugeThe juice of the bark is used in the treatment of fevers[272].

propta Seed - we have no information on this species but suggest sowing it as soon as it is ripe in a greenhouse. Sow stored seed in late winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame.

nwatta Prefers a moderately fertile well-drained sandy loam in a sunny position[200]. Tolerates calcareous soils[200]. Requires a sheltered position[200]. Plants are shade tolerant in continental climates but they require more sun in maritime areas in order to ripen the wood[200]. Rich fertile soils encourage soft sappy growth which is then more susceptible to winter damage[200]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. A tree at Kew was 6 metres tall in 1989[K]. This species is much confused with *E. ovalifolia*[1].

## 7.2.303 *Acer circinatum*

Vine Maple

6 tin 9 cyuc 2 kcaak 0 tcan 1 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta *Acer circinatum* is a deciduous Tree growing to 12 m (39ft) by 8 m (26ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower in April, and the seeds ripen from October to November. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: SapEdible Uses: SweetenerThe sap contains a certain amount of sugar and can either be used as a drink, or can be concentrated into a syrup by boiling off the water[183]. The syrup is used as a sweetener on many foods. The concentration of sugar is considerably lower than in the sugar maples (*A. saccharum*). The tree trunk is tapped in the early spring, the sap flowing better on warm sunny days following a frost. The best sap production comes from cold-winter areas with continental climates.

tcanta Basketry Fuel Paint Preservative WoodThe leaves are packed around apples, rootcrops etc to help preserve them[18, 20]. The young shoots are quite pliable and are

year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.348 *Ilex integra*

Mochi Tree

6 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Ilex integra* is an evergreen Tree growing to 6 m (19ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in April, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked. A famine food, it is only used when all else fails[177].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged[200]. Somewhat tender for its first two or three years from seed[11, 182], this species is hardy to about -10°C[184] when it gets older. Resents root disturbance, especially as the plant grows older[1, 11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.349 *Eleutherococcus innovans*

Taka-No-Tsume

6 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 6 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Eleutherococcus innovans* is a deciduous Tree growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcaakta Edible Parts: LeavesEdible Uses: Young leaves - cooked. A famine food, it is only used in times of scarcity[177].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame or greenhouse[200]. Sow stored seed in late winter in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame[200]. Root cuttings in late winter in a greenhouse[200]. Division of suckers in the dormant season[200].

nwatta Prefers a humus-rich well-drained soil in full sun[200]. Tolerates poor soils and atmospheric pollution[200]. Requires shelter from cold north and east winds[200]. Plants are hardy to between -10 and -15°C[200].

## 7.2.350 *Ilex vomitoria*

Yaupon Holly,

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Ilex vomitoria* is an evergreen Shrub growing to 6 m (19ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: Condiment TeaA mildly stimulating beverage containing caffeine is made from the dried and roasted leaves[43, 171, 183]. The tea is stimulating and intoxicating[161]. The leaves are first steeped in cold and then in boiling water[183]. They are also used to flavour ice cream and soft drinks[183].

tcanta Hedge Hedge WoodThis species is occasionally used for hedging in the southern states of America[82]. Wood - hard, heavy, strong, close grained. It weighs 46lb per cubic foot. Too small for commercial exploitation, the wood is used locally for turnery, inlay work, woodenware etc[82, 149, 227, 229].

dwatta EmeticA decoction of the leaves is emetic[4, 11, 171]. The plant was used ritually by several N. American Indian tribes. The leaves were toasted over a fire and then boiled for several hours. The resulting thick black liquid was then drunk and this was followed by immediate vomiting[213]. This was often used as a purification rite prior to hunting[213].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years[78].

nwatta Succeeds in most soils so long as they are not water-logged[200]. This species is not fully hardy in Britain, the plants are incapable of withstanding our hardest winters[11]. A slow-growing species in the wild, often forming dense thickets from root suckers[229]. The leaves remain on

and hypotensive[147]. A decoction is used in the treatment of rheumatoid arthritis and hypertension[147]. The pounded seed is used to kill lice[218].

propta Seed - best sown as soon as possible in a greenhouse. Germination can be erratic but usually takes place within 20 - 60 days at 20°c[164]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out in late spring or early summer after the last expected frosts. Root cuttings, 6 - 8cm long, December in a greenhouse. High percentage[78]. Division of suckers in the dormant season. Very easy, they can be planted out direct into their permanent positions if required.

nwatta Landscape Uses:Espalier; Standard, Specimen. Succeeds in a sunny position in ordinary garden soil but prefers a fertile humus-rich well-drained loam[164, 200]. The soil must not be allowed to dry out in the growing season[1]. Requires a position sheltered from cold drying winds[1, 200]. Plants are generally hardy to about -15°c[184, 200], they succeed outdoors at Kew though the branches are pithy and are apt to die back in winter[11]. The sub-species *C. trichotomum fargesii*. (Dode.)Rehder. is somewhat hardier, tolerating temperatures down to about -20°c[184]. Plants produce the occasional sucker[182]. The leaves have a heavy unpleasant odour when crushed[11, 182]. Flowers are produced on the current seasons growth and are sweetly scented[200]. Special Features:Not North American native, Attractive flowers or blooms.

## 7.2.345 *Salix chaenomeloides*

Japanese Pussy Willow

6 tlin 8 cyuc 1 kca3 3 tcan 2 dwat 6 m hkuc  
htut cyutli tcuphja7n hwicli hrasjlutnykfrif hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Salix chaenomeloides* is a deciduous Tree growing to 6 m (19ft 8in) at a fast rate. It is not frost tender. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - raw or cooked. They are not very palatable[172].

tcanta Landscape Uses:Border, Massing, Specimen, Winter interest. Special Features: Not North American native, Attractive flowers or blooms. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.346 *Eleutherococcus trifoliatus*

6 tlin 9 cyuc 1 kcaok 0 tcan 1 dwat 6 m hkuc  
hmimhtut cyutli tcup hwicli hyishrasjlutnyk hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta *Eleutherococcus trifoliatus* is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[111, 177].

tcanta None known

dwatta Antirheumatic Infertility Nervine TonicThe root bark and stem bark contain triterpenoid saponinsand oleonic acid[283].They are used in the treatment of rheumatism, lumbago, ostealgia and impotence[283]. The bark is also considered to be a stimulant and tonic for the central nervous system and to improve the memory[283]. The bark is collected in the summer and autumn, wrapped to bring out the aroma and then thoroughly dried[283]. The plant is used in the treatment of colds, coughs, neuralgia, rheumatism and water on the knee[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[200]. It can be slow to germinate. Stored seed requires 6 months warm followed by 3 months cold stratification[113] and can be very slow to germinate[133]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in a cold frame or greenhouse for at least the first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame[113, 200]. Cuttings of ripe wood of the current season's growth, 15 - 30cm long in a cold frame[238]. Root cuttings in late winter[200]. Division of suckers in the dormant season[200].

nwatta Prefers a light warm open loamy humus-rich soil and a position sheltered from north and east winds.[1, 11, 200] Prefers a well-drained soil and full sun[200]. Tolerates urban pollution and poor soils[200]. All parts of the plant are particularly fragrant[283]. Plants are hardy to between -10 and -15°c if they are sheltered from cold winds[200].

## 7.2.347 *Salix appendiculata*

6 tlin 9 cyuc 1 kcaok 3 tcan 2 dwat 6 m hkuc  
htut cyutli tcuphja7n hwicli hrasjlutnykfrif hpa7tli flatprik-wis hpa7tmwatli nyanhjen hjonli

drutta *Salix appendiculata* is a deciduous Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta Edible Parts: Inner bark LeavesEdible Uses: Inner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots - not very palatable[172].

tcanta Soil reclamationA pioneer plant for difficult sites[200]. It is often found in the wild as a pioneer on landslides etc, especially on calcareous formations[11]. Dynamic accumulator.

dwatta Anodyne FebrifugeThe fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current

used in basket making[118]. Straight shoots can be used to make open-work baskets[257]. A charcoal made from the wood can be mixed with oil and used as a black paint[257]. Wood - hard, heavy, durable, close-grained, strong according to some reports, but not strong according to others. Too small to be commercially important, the wood is used for cart shafts, tool handles, small boxes etc[46, 61, 82, 118, 226, 229, 257]. One report says that the wood is quite pliable and was used for making bows, snowshoe frames etc, whilst young saplings could be used as swings for baby cradles[257]. The wood is almost impossible to burn when green and has served as a cauldron hook over the fire[226].

dwatta Astringent DysenteryThe wood was burnt to charcoal and mixed with water and brown sugar then used in the treatment of dysentery and polio[257].

propta Seed is usually of good quality when produced in gardens. It is best sown as soon as it is ripe in a cold frame, it usually germinates in the following spring. Pre-soak stored seed for 24 hours and then stratify for 2 - 4 months at 1 - 8°c. It can be slow or very poor to germinate, especially if it has been dried. The seed can be harvested 'green' (when it has fully developed but before it has dried and produced any germination inhibitors) and sown immediately. It should germinate in late winter. If the seed is harvested too soon it will produce very weak plants or no plants at all[80, 113]. When large enough to handle, prick the seedlings out into individual pots and grow them on until they are 20cm or more tall before planting them out in their permanent positions. This tree often self-layers and can be propagated by this means. Cuttings of young shoots in June or July. The cuttings should have 2 - 3 pairs of leaves, plus one pair of buds at the base. Remove a very thin slice of bark at the base of the cutting, rooting is improved if a rooting hormone is used. The rooted cuttings must show new growth during the summer before being potted up otherwise they are unlikely to survive the winter. Cultivars of this species can be grafted onto *A. palmatum*, which makes a better rootstock than this species.

nwatta Landscape Uses:Specimen. Of easy cultivation, it succeeds in most good soils[111], preferring a good moist well-drained soil on the acid side[182]. Prefers a sunny position but tolerates some shade[11, 200]. Grows well in heavy clay soils. Plants are hardy to about -20°c[184]. Chlorosis can sometimes develop as a result of iron deficiency when the plants are grown in alkaline soils, but in general maples are not fussy as to soil pH. A very ornamental tree[1], a number of varieties are in cultivation[11, 200]. The branches tend to coil around other trees in much the same way as vines[226]. (A strange report because vines do not coil but climb by means of tendrils formed in the leaf axils[K].) The tree sends out long slender arching branches in the wild. These form roots when they touch the ground and the plant thereby forms large impenetrable thickets often several hectares in extent[82]. Most maples are bad companion plants, inhibiting the growth of nearby plants[18, 20]. Special Features:North American native, Inconspicuous flowers or blooms.

## 7.2.304 *Arctostaphylos columbiana*

Hairy Manzanita

6 tlin 9 cyuc 2 kcaok 0 tcan 1 dwat 1.5 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli fyifxre7t hjonli

drutta *Arctostaphylos columbiana* is an evergreen Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from March to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[3, 177]. The fruit is best harvested when slightly under-ripe since the fully mature pulp is mealy[183]. The fruit is about 8mm in diameter[200].

tcanta Dye Fuel WoodA yellowish-brown dye is obtained from the leaves, it does not require a mordant[168]. The wood burns with a bright light and so was used at dances and ceremonials by the native North American Indians[257].

The wood is hard and is used for making tools and awl handles[257].

dwatta AstringentA decoction of the bark is used in the treatment of diarrhoea[257].

propta Seed - best sown in a greenhouse as soon as it is ripe. Pre-soak dried seed in boiling water for 10 - 20 seconds or burn some straw on top of them and then stratify at 2 - 5°c for 2 months[11, 200]. The seed usually germinates in 2 - 3 months at 15°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse or cold frame for at least their first winter. Plant out in late spring or early summer. Cuttings of side shoots of the current season's growth, 5 - 8cm with a heel, August to December in a frame. Takes one year[1, 78]. Division in early spring. Take care because the plant resents root disturbance. Pot the divisions up and keep them in a lightly shaded position in a cold frame or greenhouse until they are growing away actively. Layering in spring[200]. Layering in spring[200].

nwatta Requires a deep moist well-drained light or medium lime-free loam in sun or semi-shade[11, 134, 200] but plants produce less fruit when they are grown in the shade[200]. Plants resent root disturbance and should be placed in their final positions as soon as possible[134]. This species is very closely related to *A. tomentosa*, but with a more northerly range[11].

## 7.2.305 *Podocarpus alpinus*

Tasmanian Podocarp

6 tlin 9 cyuc 2 kcaok 0 tcan 0 dwat 2 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Podocarpus alpinus* is an evergreen Shrub growing to 2 m (6ft) by 2.5 m (8ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The fruit is about 6mm x 5mm in size with a single seed[11, 200]. Although we have seen no specific reports of edibility for this fruit, it is closely related to other species with edible fruits and is very unlikely to be poisonous - we have indeed eaten it on a number of occasions and it has a mucilaginous texture with a slightly sweet flavour[K].

tcanta WoodWood.

dwatta None known

propta The seed can be sown at any time of the year in a sandy soil in a warm greenhouse, though it is probably best sown as soon as it is ripe[1]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe terminal shoots, 5 - 10cm long, July/August in a frame[78].

nwatta Prefers a rich moist non-alkaline soil[167]. Plants are shade tolerant, at least when young[200]. Hardy to about -25°c, but plants grow best in humid areas with high rainfall and mild winters[200]. Plants often fruit freely in Britain[200]. There is some doubt over the correct name for this species - the Flora of Australia says that it is a synonym of *P. lawrencei*[286], a species which, according to our records, only occurs in New Zealand[200]. A very slow growing plant, reaching 1.5 metres tall in 50 years at Kew Gardens[11]. It is a good plant for the rock garden[200]. Plants are very tolerant of pruning[200]. Plants in this genus are notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Occasional plants are monoecious[286].

## 7.2.306 *Angelica acutiloba*

Dong Dang Gui

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta *Angelica acutiloba* is a PERENNIAL growing to 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta None known

dwatta Emmenagogue Oxytoxic Sedative Tonic Women's complaintsThe root is emmenagogue, oxytoxic, sedative and tonic. It is used in the treatment of women's complaints[61, 174, 218] and also eases dizziness[61].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[200]. Plants are reliably perennial if they are prevented from setting seed[200]. Cultivated as a medicinal plant in Japan[58, 275].

## 7.2.307 *Quercus pungens*

Sandpaper Oak, Pungent oak

6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 2 m hkuc hmimhtut cyutli tcup hwicli jlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Quercus pungens* is an evergreen Shrub growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Coffee GumSeed - cooked[161, 177]. The seed is small, up to 1cm long[200]. Up to 22mm according to another report[229]. It can be dried, ground into a powder and used as a thickening in stews etc or mixed with cereals for making bread. The seed contains bitter tannins, these can be leached out by thoroughly washing the seed in running water though many minerals will also be lost. Either the whole seed can be used or the seed can be dried and ground it into a powder. It can take several days or even weeks to properly leach whole seeds, one method was to wrap them in a cloth bag and place them in a stream. Leaching the powder is quicker. A simple taste test can tell when the tannin has been leached. The traditional method of preparing the seed was to bury it in boggy ground overwinter. The germinating seed was dug up in the spring when it would have lost most of its astringency. The roasted seed is a coffee substitute. A gum obtained from the bark can be used for chewing[257].

tcanta Dye Gum Repellent TanninA mulch of the leaves repels slugs, grubs etc, though fresh leaves should not be used as these can inhibit plant growth[20]. Oak galls are excrecences that are sometimes produced in great numbers on the tree and are caused by the activity of the larvae of different insects. The insects live inside these galls, obtaining their nutrient therein. When the insect pupates and leaves, the gall can be used as a rich source of tannin, that can also be used as a dyestuff[4]. A tan-coloured dye is obtained from the bark[257].

dwatta Astringent DysenteryAny galls produced on the tree are strongly astringent and can be used in the treatment of haemorrhages, chronic diarrhoea, dysentery etc[4].

propta Seed - it quickly loses viability if it is allowed to dry out. It can be stored moist and cool overwinter but is best sown as soon as it is ripe in an outdoor seed bed, though it must be protected from mice, squirrels etc. Small quantities of seed can be sown in deep pots in a cold frame. Plants produce a deep taproot and need to be planted out into their permanent positions as soon as possible, in fact seed sown in situ will produce the best trees[11]. Trees should not be left in a nursery bed for more than 2 growing seasons without being moved or they will transplant very badly.

nwatta Prefers a good deep fertile loam which can be on the stiff side[1, 11]. Young plants tolerate reasonable levels of side shade[200]. Tolerates moderate exposure, surviving well but being somewhat stunted[200]. Prefers warmer summers than are usually experienced in Britain, trees often grow poorly in this country and fail to properly ripen their wood resulting in frost damage overwinter[200]. The tree flowers on new growth produced in spring, the seed ripening in its first year[200, 229]. Intolerant of root disturbance, trees should be planted in their permanent positions whilst young[11]. Hybridizes freely with other members of the genus[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.308 *Ehretia dicksonii*

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 10 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwislip hpa7tmwatli xre7t hjonli

drutta *Ehretia dicksonii* is a deciduous Tree growing to 10 m (32ft) by 10 m (32ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[105, 177]. No further details. The fruit is about 2cm in diameter[200].

tcanta WoodWood - light and tough. Used for carrying poles[46, 109].

dwatta None known

propta Seed - we have no information on this species but suggest sowing it as soon as it is ripe in a greenhouse. Sow stored seed in late winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame.

nwatta Prefers a moderately fertile well-drained sandy loam in a sunny position[200]. Requires a sheltered position[200]. Plants are shade tolerant in continental climates but they require more sun in maritime areas in order to ripen the wood[200]. Rich fertile soils tend to encourage soft sappy growth which is then subject to frost damage over winter[200]. Succeeds on chalky soils[200]. Mature plants are frost hardy, though young plants are often cut back by the frost[200]. The young growth in spring is also susceptible to frost-damage[K]. A tree was 6 metres tall at Kew in 1989[K]. This species closely resembles *Ehretia macrophylla* Wall. of the E. Himalaya, but the latter has the thin chartaceous, narrower leaves without scabrous on the upper surface and with sparse pubescent hairs on the lower surface, and smaller drupes, ca. 8 mm in diam[275]. The flowers, which are borne on the ripened wood of the previous season's growth, emit a powerful spicy fragrance[245].

## 7.2.309 *Nyssa aquatica*

Water Tupelo

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 30 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyik hpa7tli priklwis hpa7tmwatli xre7t hjonli

means smooth but the young shoots of this species are hairy whilst the young shoots of *L. edulis* are smooth[11].

## 7.2.342 *Clematis buchananiana*

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Clematis buchananiana* is a deciduous Climber growing to 6 m (19ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: DrinkTender young leaves - coked as a vegetable[272]. Some caution is advised, see the notes above on toxicity[K]. The plant is used in Nepal to make marcha, a fermented cake from which an alcoholic beverage is distilled[272].

tcanta None known

dwatta Analgesic Odontalgic Poultice Stomachic VulneraryA paste of the roots is used as a poultice to treat swellings caused by inflammation[272]. The juice of the root is used in the treatment of peptic ulcers[272]. The juice is also inhaled to get rid of coughs and colds[272]. A paste of the stem or root bark is kept pressed against the teeth for about 15 minutes to relieve toothache[272]. The juice of the plant is applied externally to cuts and wounds[272]. It is also taken internally in the treatment of indigestion[272]. The leaf juice is taken internally, and is also applied externally to the forehead, in the treatment of coughs and colds[272]. It is also warmed and placed inside the nose when treating sinusitis[272].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for the first winter. Plant out in late spring or early summer, after the last expected frosts. Intermodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade and its shoots growing up to the light[164]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Succeeds in acid as well as alkaline soils[200]. A very variable species, it varies considerably in hardness according to the region from which the plant was first obtained - those obtained from the higher limits of its range being more cold-tolerant[273]. It grows best in the milder or sub-tropical areas where its late-flowering habit can be fully appreciated. In colder areas the flowers are often badly damaged by frost[273]. A vigorous plant, capable of putting out new shoots up to 4 metres long in a season[273]. A twining plant, the leafstalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants flower on the current seasons growth. They usually require no pruning, especially if left to clamber into large shrubs and trees. Weak or dead stems can be removed in the winter and, where pruning may be required to reduce the size of the plant, shoots can be cut back by up to two thirds in the winter[273]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. Plants in this genus are notably resistant to honey fungus[200]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.343 *Coprosma propinqua*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 6 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Coprosma propinqua* is an evergreen Shrub growing to 6 m (19ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from February to March, and the seeds ripen from August to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: CoffeeFruit - raw or cooked[173]. Sweet, but with little flavour[225]. The pale to deep violet-blue fruit is about 8mm wide[200, 225]. The roasted seed is an excellent coffee substitute[153].

tcanta Dye Hedge HedgeTolerant of pruning, it makes a good dense hedging plant[225]. A yellow dye is obtained from the wood, it does not require a mordant[153].

dwatta None known

propta Seed - probably best sown as soon as it is ripe in a greenhouse or cold frame[K]. Sow stored seed in spring in a cold frame[200]. Germination can be slow, often taking more than 12 months even when fresh seed is used[K]. When the seedlings are large enough to handle, prick them out into individual pots. Grow on the plants for at least their first winter in a greenhouse and plant out in late spring or early summer. Give the plants some protection from the cold for their first winter outdoors[K]. Cuttings of mature wood of the current year's growth, autumn in a frame.

nwatta Requires a moist, very well-drained neutral to slightly acid soil in full sun or light shade[200]. An easily grown plant, it succeeds in moist soils[225]. Somewhat intolerant of frost, this species is only likely to succeed outdoors in the milder areas of Britain[11, 200]. Another report says that it is fully hardy in Britain[225]. It flowers freely in Britain, fruiting heavily if pollinated[225]. A polymorphic species, it hybridizes freely with other members of this genus[200, 225]. Plants are tolerant of heavy clipping or pruning[225]. Plants are normally dioecious, though in some species the plants produce a few flowers of the opposite sex before the main flowering and a few hermaphrodite flowers are sometimes produced[225]. Male and female plants must usually be grown if seed is required.

## 7.2.344 *Clerodendrum trichotomum*

Chou Wu Tong, Harlequin glorybower, Ferruginous clerodendrum, Harlequin Glory Bower

6 tlin 11 cyuc 1 kcaak 0 tcan 3 dwat 6 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Clerodendrum trichotomum* is a deciduous Tree growing to 6 m (19ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young sprouts and leaves - cooked[105, 177].

tcanta ParasiticideNone known

dwatta Analgesic Antipruritic Antirheumatic Hypotensive Parasiticide SedativeThe leaves are mildly analgesic, antipruritic, hypotensive and sedative[176, 218, 254]. They are used externally in the treatment of dermatitis and internally for the treatment of hypertension, rheumatoid arthritis, joint pain, numbness and paralysis[176, 218, 254]. When used in a clinical trial of 171 people, the blood pressure of 81% of the people dropped significantly - this effect was reversed when the treatment was stopped[254]. The plant is normally used in conjunction with *Bidens bipinnata*[218]. When used with the herb *Siegesbeckia pubescens* it is anti-inflammatory[254]. The roots and leaves are antirheumatic

Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: Coffee TeaThe leaves are used as a tea substitute[177, 183]. The roasted seed is used as a coffee substitute[177, 183].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged[200]. One report says that this species is hardy to about -15°c[184], another that it is hardy to about -5°c[260], whilst others say that it is not fully hardy in many parts of Britain and is best grown in the milder areas of the country[188, 200]. Plants succeed but they do not thrive outdoors at Kew, though they thrive just a few miles south of there[11]. Resents root disturbance, especially as the plant grows older[1, 11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.339 Lithocarpus edulis

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 9 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Lithocarpus edulis is an evergreen Tree growing to 9 m (29ft 6in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[123, 177, 183]. Not of a good taste[105]. The poor taste is probably due, at least in part, to the presence of tannins. These can be removed by soaking the seed in water for a few days, changing the soak water regularly. The process can be speeded up by grinding the seed into a powder prior to soaking[K]. The seed is an acorn about 25mm long and 8mm wide[K].

tcanta None known

dwatta None known

propta The seed is best sown as soon as it is ripe in the autumn in a cold frame[200]. It needs to be protected from mice, squirrels and other seed eaters. The seed has a short viability but can be stored for a few months if kept cool and slightly damp - the salad compartment of a fridge is a good storage place. Germination takes place in the winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots. If the plants are 15cm or more tall by the summer they can be planted out into their permanent positions. Give them a good weed-excluding mulch and some protection from the cold for their first couple of years outdoors. If growth is not sufficient then grow them on in the greenhouse for their first winter and plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Prefers a deep fertile soil with medium drainage[200]. This species is only hardy in the southern half of England[11]. A tree growing in deep shade did not produce seed at Kew in the very hot summer of 1989[K]. A tree at Hilliers produced lots of seed in 1994, but they were not fertile and did not contain endosperm[K]. Plants are often confused with *L. glabra*[1].

## 7.2.340 Euptelea polyandra

Euptelea

6 tlin 7 cyuc 1 kcaak 0 tcan 0 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Euptelea polyandra is a deciduous Tree growing to 8 m (26ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked. A famine food, used when all else fails[179].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering.

nwatta Landscape Uses:Border, Hedge, Screen, Standard, Specimen. Prefers an open moderately rich free soil[1] and full sun[200]. Grows well in an open situation in a woodland garden or shrub border[200]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 7.2.341 Lithocarpus glaber

Japanese Oak

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 7 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta Lithocarpus glaber is an evergreen Tree growing to 7 m (23ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[177]. The seed probably contains bitter-tasting tannins. These can be removed by soaking the seed in water for a few days, changing the soak water regularly. The process can be speeded up by grinding the seed into a powder prior to soaking[K].

tcanta None known

dwatta None known

propta The seed is best sown as soon as it is ripe in the autumn in a cold frame[200]. It needs to be protected from mice, squirrels and other seed eaters. The seed has a short viability but can be stored for a few months if kept cool and slightly damp - the salad compartment of a fridge is a good storage place. Germination takes place in the winter or early spring. When they are large enough to handle, prick the seedlings out into individual pots. If the plants are 15cm or more tall by the summer they can be planted out into their permanent positions. Give them a good weed-excluding mulch and some protection from the cold for their first couple of years outdoors. If growth is not sufficient then grow them on in the greenhouse for their first winter and plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Prefers a deep fertile soil with medium drainage[200]. Plants are often confused with *L. edulis*[11]. The botanical name of this species is confusing - glaber

drutta Nyssa aquatica is a deciduous Tree growing to 30 m (98ft 5in) at a medium rate. It is in flower from April to May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: FruitEdible Uses: Fruit - occasionally eaten raw but more often used in preserves[177, 183]. The fruit is up to 4cm long, it has a thick, tough skin with a thin acid flesh surrounding a large seed[82, 229].

tcanta Cork Dye WoodThe wood of the roots is sometimes used for making floats instead of cork[82]. A red dye can be obtained from the burnt bark mixed with water and the ash of red oak (*Quercus rubra*)[257]. Wood - light, close-grained, soft, difficult to split[82, 229, 235]. Tough according to one report[235], weak according to another[229]. It has an intricately contorted and twisted grain[82]. It weighs 29lb per cubic foot[235], and is used for various things such as panelling, broom handles, woodenware and crates[82, 229]. It is sometimes exploited commercially[229].

dwatta None known

propta The seed can be sown in late winter in a cold frame[78] but would probably benefit from an earlier sowing if the seed can be obtained any sooner. Three months stratification at 5°c improves germination[200]. Germination rates are variable[78]. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Layering.

nwatta Landscape Uses:Specimen, Woodland garden. Although this is a plant of swamps and other wet soils in the wild, once established it can succeed in Britain when growing in an ordinary good loamy soil in sun or semi-shade[1]. This plant probably requires a very wet soil, it is very difficult to establish in Britain, though it should be hardy at least in the milder parts of the country. It prefers a neutral to alkaline soil[200]. Plants are fast-growing in well-drained bottomlands in the wild, but slower in swampy sites[229]. They are long-lived trees, commencing to bear seeds when about 30 years old and usually producing heavy crops each year[229]. The seed is mainly distributed by water[229]. Resents root disturbance[1]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: North American native, Wetlands plant, Attracts butterflies, Inconspicuous flowers or blooms.

## 7.2.310 Aciphylla colensoi

Wild Spaniard

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.9 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Aciphylla colensoi is an evergreen Perennial growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Leaves RootEdible Uses: Gum-Root - cooked. Aromatic[173]. The plant yields a resin that is used as a chewing gum[173]. Shoots[173]. No further details.

tcanta GumNone known

dwatta None known

propta Seed - best sown in a greenhouse as soon as it is ripe[200]. Stored seed should be sown in a greenhouse in late winter or early spring. Germination can be very slow. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter before planting them out in late spring or early summer, after the last expected frosts.

nwatta Requires a perfectly drained gritty soil in full sun[233]. Prefers a climate with rather damp air[233]. Plants are hardy to about -10°c and are succeeding outdoors in a mild garden in N. Ireland[233]. Dioecious. Female plants sometimes have a few male flowers but usually male and female plants must be grown if seed is required[200].

## 7.2.311 Chrysolepis chrysophylla

Golden Chinquapin, Giant chinquapin

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 20 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli frusflatprik hpa7tmwatli hjonli

drutta Chrysolepis chrysophylla is an evergreen Tree growing to 20 m (65ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind, midges. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - raw or cooked[22, 46]. Very sweet and much appreciated[63, 71, 82, 105, 183]. The seed can also be dried, ground into a powder and used as a thickening in soups, mixed with cereals when making bread etc[257]. The seed is about 1cm long and has a hard shell[183].

tcanta WoodWood - fine-grained, light, soft, not strong. Occasionally used for making ploughs and other agricultural implements, and also as a fuel[46, 61, 82, 229].

dwatta None known

propta Seed - best sown in a cold frame as soon as it is ripe, the seed must be protected from mice etc[200]. The seed has a short viability and should not be allowed to dry out. If stored overwinter it should be kept cool and moist. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts, and consider giving them some protection from the cold for their first winter outdoors.

nwatta Requires a lime-free soil[1]. Prefers a sheltered semi-shaded position and a light deep moist soil[1, 11]. A very ornamental tree[183], it is slow to moderate growing and can live 400 - 500 years in the wild[229]. One report says that this species only succeeds in Oceanic and Mediterranean climates[200]. This species has a very wide natural range in N. America, seeds should be tried from various provenances to find more suitable selections for Britain[11]. Another report says that the plant is only found in a small area of California and Oregon, but that it grows on a wide range of soil types[229]. There are trees 16 metres tall in Surrey and Buckinghamshire[11], it also fruits in Cornwall[59] and fruits well in addition to self-sowing at Edinburgh botanical gardens[11]. Flowers are produced on the current years growth, the seed taking two summers to mature[229]. The catkins have an unpleasant hawthorn-like smell to attract midges for their pollination[245]. This species resists chestnut blight[200].

## 7.2.312 Gaultheria pumila leucocarpa

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli nyanhjen hjonli

drutta Gaultheria pumila leucocarpa is an evergreen Shrub growing to 0.2 m (0ft 8in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[11, 177]. The fruit is about 17 - 22mm in diameter. tcanta A useful ground cover for sun or light shade, it spreads rapidly.

dwatta None known  
propta The seed requires a period of cold stratification. Pre-chill for 4 - 10 weeks and then surface sow in a lime-free compost in a shady part of the greenhouse and keep the compost moist[78]. The seed usually germinates well, usually within 1 - 2 months at 20°C, but the seedlings are liable to damp off. It is important to water them with care and to ensure that they get plenty of ventilation. Watering them with a garlic infusion can also help to prevent damping off[K]. Prick out the seedlings into individual pots when they are about 25mm tall and grow them on in light shade in the greenhouse for at least their first winter[K]. Plant them out in late spring or early summer. The seedlings are susceptible to spring frosts so might need some protection for their first few years outdoors. The leaves remain very small for the first few years[11]. Cuttings of half-ripe wood 3 - 6cm long, July/August in a frame in a shady position. They form roots in late summer or spring[78]. A good percentage usually take. Division in spring just before new growth begins. 'Drop' the plants 12 months earlier by digging them up and replanting them deeper in the soil so that the branches are buried and can form roots. This works best in a sandy soil[78]. It is best to pot up the divisions and grow them on in a lightly shaded position in a greenhouse until they are established. Plant them out in the summer. Layering in September/October. Takes 12 months[78].

nwatta Requires a light well-drained lime-free soil[200]. Spreading rapidly[1, 49], this species can be invasive[182]. The plant can make a good nesting place for mice, these mice then eat the bark of the stems in winter causing die-back. Dioecious. Male and female plants must be grown if seed is required. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.313 Thymus mastichina

Mastic Thyme  
6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat m hkuc  
htut cyutli hgatkuyctcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Thymus mastichina is an evergreen Shrub growing to 0.3 m (1ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: CondimentThe leaves are used as a seasoning[183]. They have a pungent eucalyptus-like aroma[238]. If the leaves are to be dried, the plants should be harvested in early and late summer just before the flowers open and the leaves should be dried quickly[200]. The plant is also the source of an essential oil, called 'oil of marjoram', that is used extensively as a flavouring for soups etc[4, 61, 177, 183, 238].

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[4, 200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are

growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Requires a light well-drained preferably calcareous soil in a sunny position[1, 200]. Succeeds in dry soils. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to about -10°C[200], but are best given some protection in the winter - a pane of glass supported over the plant is usually sufficient[1]. The flowers are rich in nectar and are very attractive to honey bees[200]. The bruised leaves are powerfully aromatic[245]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[1].

## 7.2.314 Arisaema flavum

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.4 m hkuc  
pcimhmimhtut cyutli hgattcup hwicli hrasljut hpa7tli flatprikklwis hpa7tmwatli dyat hjonli

drutta Arisaema flavum is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from June to July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked and used as a vegetable[272]. Some caution is advised, see the notes above on toxicity.

tcanta InsecticideUsed as a pesticide[91]. No further details are given, but the report might be referring to the tubers.

dwatta Antispasmodic Epilepsy ExpectorantExpectorant. It is used in the treatment of chronic tracheitis, bronchiectasis, tetanus and epilepsy[91].

propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a couple of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool moist peaty soil in the bog, woodland garden or a sheltered border in semi-shade[134, 200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. This species is the most drought tolerant member of the genus. Plants are nearly hardy in Britain, they normally succeed outdoors in the milder areas of the country[1]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year. The flowers of this species are usually either monoecious or all male[266].

## 7.2.315 Carex arenaria

Sand Sedge  
6 tlin 9 cyuc 2 kcaak 0 tcan 2 dwat 0.5 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasljut hpa7tli flatprikklwis hpa7tmwatli hjonli

drutta Carex arenaria is a PERENNIAL growing to 0.5 m (1ft 8in) by 2 m (6ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from July to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils

## 7.2.335 Sorbus vestita

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Sorbus vestita is a deciduous Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[105, 146, 272]. The fruits are up to 2cm across[200].

tcanta None known  
dwatta None known

propta Seed - best sown as soon as it is ripe in a cold frame[78, 80]. If you have sufficient seed it can be sown in an outdoor seedbed[78, 80]. Stored seed germinates better if given 2 weeks warm then 14 - 16 weeks cold stratification[98], so sow it as early in the year as possible. Prick out the seedlings into individual pots when they are large enough to handle. Seedlings are very slow to put on top-growth for their first year or two[11], but they are busy building up a good root system. It is best to keep them in pots in a cold frame for their first winter and then plant them out into their permanent positions in late spring.

nwatta Succeeds in most reasonably good soils in an open sunny position[11]. Tolerates light shade[188], though it fruits better in a sunny position[K]. Plants are susceptible to fireblight[188]. A very ornamental tree[11], unfortunately the fruit is not freely borne in Britain[11]. Plants are apt to die back without any warning[11].

## 7.2.336 Cornus nuttallii

Mountain Dogwood, Pacific dogwood, Western Dogwood  
6 tlin 8 cyuc 1 kcaak 0 tcan 2 dwat 10 m hkuc  
hmimhtut cyutli kyuctcup hwicli hyishrasljutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Cornus nuttallii is a deciduous Tree growing to 10 m (32ft) by 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May, and the seeds ripen in October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: The fruit is possibly edible[177]. The fruit is about 10mm in diameter[200] and has a thin, mealy flesh[82].

tcanta Basketry Dye Tannin WoodAn intense brown dye is obtained by boiling the bark[257]. The bark is rich in tannin and has been used as a preservative[257]. The long slender branches have been used in making baby baskets[257]. Wood - exceedingly hard, heavy, strong, close grained. It is used for tool handles, cabinet making etc[46, 61, 82, 118].

dwatta Antiperiodic Febrifuge Laxative Malaria Tonic-The bark is antiperiodic, cathartic, febrifuge, laxative and tonic[46, 61, 118, 257]. An infusion is used as a quinine substitute in the treatment of malaria[46, 118, 226]. The infusion has also been used in the treatment of stomach complaints[257]. Externally, it is used to treat ulcers[257].

propta Seed - best sown as soon as it is ripe in a cold frame or in an outdoors seedbed if there is sufficient seed[80, 113]. The seed must be separated from the fruit flesh since this contains germination inhibitors[80, 164]. Sown seed should be cold stratified for 3 - 4 months and stored as possible in the year[164]. Scarification may also help as may a period of about 3 days warm stratification at 15°C before the cold stratification[80, 164]. Germination, especially of stored seed, can be very slow, taking 18 months or more[164]. Prick out the seedlings of cold-frame sown seeds into individual pots as soon as they are large enough to handle and grow the plants on for their first winter in

a greenhouse, planting out in the spring after the last expected frosts. Cuttings of half-ripe side shoots, July/August in a frame. Cuttings of mature wood of the current year's growth, taken with a heel if possible, autumn in a cold frame. High percentage[78]. Layering of new growth in June/July. Takes 9 months[78].

nwatta Landscape Uses:Border, Specimen, Woodland garden. An easily grown plant, it succeeds in any soil of good or moderate fertility[1], ranging from acid to shallow chalk[200]. Another report says that it does not thrive in poor chalky soils[182]. Grows well in heavy clay soils. Succeeds in full sun or light shade[188]. Plants are hardy to about -15°C[184], but they require long hot humid summers in order to promote good growth[200]. A very ornamental tree[1], but it is usually short-lived in Britain and does not do well in the north of this country[11]. There is some evidence to suggest that trees grow better on poor soils and can be killed by too much kindness. A very good tree has been seen on a poor gravel soil[182]. Closely related to C. florida[226]. This species is the floral emblem of British Columbia[226]. A number of named varieties have been developed for their ornamental value[182]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attracts birds, North American native, Blooms are very showy.

## 7.2.337 Euphorbia tetragona

Naboom  
6 tlin 9 cyuc 1 kcaak 2 tcan 1 dwat 10 m hkuc  
hmimhtut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta Euphorbia tetragona is an evergreen Tree growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: NectarEdible Uses: The flowers are rich in nectar and this is sometimes used in confectionery[183].

tcanta MiscellanyWildlife - The flowers are rich in nectar. Dynamic accumulator.

dwatta MiscellanyOne report says that this species also supplies the drug, though it fails to say what the drug is or its medicinal actions[4].

propta Seed - sow spring in a shaded position in a greenhouse[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.

nwatta Prefers a light well-drained moderately rich loam in an open position[200]. Succeeds in dry soils[1]. According to [200] this species is hardy to climatic zone 7 (tolerating temperatures down to about -10°C). This statement must be viewed with some scepticism, the plant is unlikely to be at all frost-tolerant. Hybridizes with other members of this genus[200]. The ripe seed is released explosively from the seed capsules[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. This genus has been singled out as a potential source of latex (for making rubber) for the temperate zone, although no individual species has been singled out[141].

## 7.2.338 Ilex latifolia

Tarajo  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 10 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex latifolia is an evergreen Tree growing to 10 m (32ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . Suitable for: light (sandy), medium (loamy) and heavy (clay) soils.



seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out to their permanent positions in late spring or early summer, after the last expected frosts. Consider giving the plants some protection from the cold for at least their first winter outdoors. Layering[200].

nwatta Requires a deep moist humus-rich loam and a sunny sheltered position[200]. Trees are hardy to about -12°C in Britain[200], but they are not usually a success in our climate[1], preferring a warm dry continental climate[200]. A tree in Hampshire is growing and fruiting well[11]. A tree at Kew flowered heavily in the hot summer of 1989[K].

## 7.2.333 Rhododendron arboreum

6 tin 9 cyuc 1 kcaok 0 tcan 2 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Rhododendron arboreum is an evergreen Shrub growing to 12 m (39ft) by 3 m (9ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaeta Edible Parts: Flowers LeavesEdible Uses: The tender leaves are used as a cooked vegetable[105, 158, 183]. Caution is advised, see the notes above on toxicity. Flowers - raw or cooked[272]. A sweet-sour taste, they are said to make a good sub-acid jelly[183]. Th flowers are sometimes simply pickled by adding salt and chili[272]. Caution is advised, large quantities can cause intoxication[2, 183].

tcanta Charcoal Fuel Repellent WoodThe juice of the leaves is spread over cots and beds to get rid of bed lice[272]. Wood - soft, even grained, seasons badly. Used in turnery, it can also be used to make charcoal and for fuel[51, 158]. Th wood is much employed in Nepal where it is used for making household implements, building small houses and fences[272]. Planks of the wood are carved to make boxes, cupboards and other furniture[272]. It is a very good fuel, burning well with a long-lasting heat - overcollection of the wood for fuel, and also for making charcoal, has become a cause for conservation concern[272].

dwatta Astringent Dysentery Poulitce StomachicThe young leaves are astringent and poultice[158]. They are made into a pasteand then applied to the forehead in the treatment of headaches[240, 272]. The juice of the bark is used in the treatment of coughs, diarrhoea and dysentery[272]. A decoction of the flowers is used to check a tendency to vomit, especially if there is also a loss of appetite[272]. The juice of the flowers is used in the treatment of menstrual disorders[272]. The petals are eaten to assist the removal of any animal bones that have become stuck in the throat[262].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in most humus rich lime free soils except those of a dry arid nature or heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. Requires a pH between 4.5 and 5.5[200]. Hardy to between -10 and -15°C, the pink flowered form is hardier than the red[184]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. There are many named varieties selected for their ornamental value[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. This plant is the national flower

of Nepal[51]. The flowers are sold in local markets and used as offerings to the Gods and Goddesses[272]. A very ornamental plant[1], it is not very hardy outdoors in much of Britain, but grows well in the milder areas of the country[1]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.334 Salix babylonica

Weeping Willow, Babylon Weeping Willow  
6 tin 9 cyuc 1 kcaok 4 tcan 3 dwat 12 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnykifrip hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Salix babylonica is a deciduous Tree growing to 12 m (39ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in flower in April, and the seeds ripen in May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist or wet soil.

kckaeta Edible Parts: Inner bark Leaves MannaEdible Uses: TeaInner bark - raw or cooked. It can be dried, ground into a powder and then added to cereal flour for use in making bread etc. A very bitter flavour, it is a famine food that is only used when all else fails[172]. Young shoots and flower buds - cooked[105, 177, 183]. Not very palatable[172]. Older leaves are used to adulterate tea[183]. A source of a manna-like substance[183].

tcanta Basketry Hair Soil stabilizationLandscape Uses: Erosion control, Aggressive surface roots possible, Pollard, Specimen. The stems are very flexible and are used in basket making[146, 272]. The plant is usually coppiced annually when grown for basket making, though it is possible to coppice it every two years if thick poles are required as uprights. The extensive root system makes this species useful for binding soils[146, 272]. A decoction or infusion of the bark has been used as a wash to make the hair grow[257]. Dynamic accumulator.

dwatta Anodyne Antirheumatic Astringent Febrifuge Poulitce SkinThe leaves and bark are antirheumatic, astringent and tonic[178, 240]. A decoction of the leaves is used in the treatment of abscesses, carbuncle, fever, rheumatism, skin diseases, ulcers etc[218]. An infusion of the bark has been used to treat diarrhoea and fevers[257]. The bark can be used as a poultice[257]. The stem bark is used in the treatment of skin eruptions due to parasites[218]. The root bark is used in a bath for the treatment of parasitic skin diseases[218]. A gum from the stems is used in the treatment of foul sores[218]. The down of the seeds is used in the treatment of fevers, haemorrhages, jaundice, rheumatism etc[218]. The fresh bark of all members of this genus contains salicin[226], which probably decomposes into salicylic acid (closely related to aspirin) in the human body[213]. This is used as an anodyne and febrifuge[226].

propta Seed - must be surface sown as soon as it is ripe in late spring. It has a very short viability, perhaps as little as a few days. Cuttings of mature wood of the current year's growth, November to February in a sheltered outdoor bed or planted straight into their permanent position and given a good weed-suppressing mulch. Very easy. Plant into their permanent positions in the autumn. Cuttings of half-ripe wood, June to August in a frame. Very easy.

nwatta Succeeds in most soils, including wet, ill-drained or intermittently flooded soils[1, 11], but prefers a damp, heavy soil in a sunny position[200]. Rarely thrives on chalk[200]. This species rarely thrives in Britain[11], it is very subject to canker and has been largely replaced in cultivation by S. 'Chrysocoma'[188]. The root system is rather aggressive and can cause problems with drains[200]. Hybridizes freely with other members of this genus[200]. Although the flowers are produced in catkins early in the year, they are pollinated by bees and other insects rather than by the wind[11]. Plants in this genus are notably susceptible to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required. Special Features: Not North American native, Wetlands plant, Inconspicuous flowers or blooms.

and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kckaeta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. No further details are given, but the seed is small and fiddly to use[K].

tcanta Soil stabilizationThe long creeping rootstock is valuable for binding sandy soils[1, 4, 115].

dwatta Antiflatulent Antirheumatic Diaphoretic Diuretic Eczema Hypoglycaemic TBThe root is diaphoretic and diuretic[4, 7, 9, 21, 61]. An infusion has been used in the treatment of bronchitis and catarrhs, abdominal and stomach disorders, liver complaints, arthritis and rheumatism and skin conditions such as eczema and pruritus[9]. It has been used as a substitute for the tropical plant sarsaparilla[4]. The root is harvested in the spring and dried for later use[9].

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta Best grown in a sandy soil in a sunny position[200]. Tolerates maritime exposure[17]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.316 Schisandra sphenanthera

6 tin 9 cyuc 2 kcaok 0 tcan 5 dwat 7 m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwis hpa7tmwatli nyanhjen hjonli

drutta Schisandra sphenanthera is a deciduous Climber growing to 7 m (23ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May, and the seeds ripen from July to September. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required) . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kckaeta Fruit - raw or cooked. We have no specific information on this species, but the fruit is quite probably edible[K].

tcanta None known

dwatta Antirheumatic Antitussive Aphrodisiac Astringent Cancer Cardiotoxic Cholagogue Dysentery Expectorant Hepatic Lenitive Nerve Pectoral Sedative Stimulant Tonic UrinaryThe following report is for S. chinensis. This species is used for similar purposes in southern China[238]. Wu Wei Zi is commonly used in Chinese herbalism, where it is considered to be one of the 50 fundamental herbs[218]. It is an excellent tonic and restorative, helping in stressful times and increasing zest for life[254]. It is considered to be a substitute for ginseng and is said to be a tonic for both the male and the female sex organs[238]. The fruit is antitussive, aphrodisiac, hepatic, astringent, cardiotoxic, cholagogue, expectorant, hypotensive, lenitive, nervine, pectoral, sedative, stimulant and tonic[174, 176, 178, 218]. Low doses of the fruit are said to stimulate the central nervous system whilst large doses depress it[218]. The fruit also regulates the cardiovascular system[218]. It is taken internally in the treatment of dry coughs, asthma, night sweats, urinary disorders, involuntary ejaculation, chronic diarrhoea, palpitations, insomnia, poor memory, hyperacidity, hepatitis and diabetes[238]. Externally, it is used to treat irritating and allergic skin conditions[238]. The fruit is harvested after the first frosts and sun-dried for later use[238]. The fruit contains lignans[254]. These have a pronounced protective action on the liver. In one clinical trial there was a 76% success rate in treating patients with hepatitis, no side effects were noticed[254]. The seed is used in the treatment of cancer[218]. The plant is antirheumatic[218]. A mucilaginous decoction obtained from

the branches is useful in the treatment of coughs, dysentery and gonorrhoea[218].

propta Seed - best sown in the autumn in a cold frame[200, 238]. Pre-soak stored seed for 12 hours in warm water and sow in a greenhouse in the spring[238]. Germination can be slow and erratic. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in light shade in the greenhouse for their first 2 years. Plant them out into their permanent positions in early summer. Cuttings of half-ripe wood, 5 - 8cm with a heel, August in a frame. Overwinter in the greenhouse and plant out in late spring[11, 78]. Good percentage[78]. Layering of long shoots in the autumn[200].

nwatta Prefers a rich well-drained moisture retentive soil[11, 200]. Prefers a slightly acid soil but tolerates some alkalinity if plenty of organic matter is added to the soil[200]. Requires some protection from the most intense sunlight[200]. Plants are intolerant of drought[K]. This species is hardy to about -7°C[200]. It will succeed outdoors in the milder areas of Britain if given the protection of a woodland or a south or west-facing wall[200]. The young growth in spring can be damaged by late frosts. Plants climb by twining around supports. Any pruning is best carried out in the spring[219]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.317 Angelica pubescens

Du Huo  
6 tin 9 cyuc 2 kcaok 0 tcan 3 dwat 1.8 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyk hpa7tli flatprikwis hpa7tmwatli fyfjxre7t hjonli

drutta Angelica pubescens is a PERENNIAL growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kckaeta Edible Parts: LeavesEdible Uses: Leaves - cooked[105, 177].

tcanta None known

dwatta Anodyne Antiinflammatory Antirheumatic Carminative Emmenagogue Nervine VasodilatorThe roots and rhizomes are anodyne, anti-inflammatory, antirheumatic, carminative, nervine and vasodilator[147, 176]. A decoction is used to promote menstruation[218], to treat rheumatoid arthritis, rheumatism, headache, toothache and abscesses[147]. This herb is used medicinally in the same ways as A. dahurica (Bai Zhi)[254]. These uses are as follows: - Bai Zhi has been used for thousands of years in Chinese herbal medicine where it is used as a sweat-inducing herb to counter harmful external influences[254]. Bai Zhi is contraindicated for pregnant women[254]. The root is analgesic, anodyne, antibacterial, antidote, carminative, diaphoretic, diuretic, poultice and stimulant[176, 178, 218]. It is used in the treatment of frontal headache, rhinitis, boils, carbuncles and skin diseases[176]. It appears to be of value in treating the facial pain of trigeminal neuralgia[254]. Small quantities of angelicotoxin, one of the active ingredients in the root, have an excitatory effect on the respiratory centre, central nervous system and vasculomotor centre. It increases the rate of respiration, increases blood pressure, decreases the pulse, increases the secretion of saliva and induces vomiting[176]. In large doses it can cause convulsions and generalized paralysis[176].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[200]. Plants are reliably perennial if they are prevented from setting seed[200]. A polymorphic species[58].

## 7.2.318 *Ulmus alata*

Winged Elm

6 tlin 9 cyuc 2 kcaak 0 tcan 0 dwat 15 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Ulmus alata* is a deciduous Tree growing to 15 m (49ft 3in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 4 and is not frost tender. It is in flower in May, and the seeds ripen in June. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked.

tcanta String WoodThe inner bark is very fibrous and can be used as a string[46, 61, 82, 149]. Wood - close-grained, heavy, hard, not strong, brittle, difficult to split. It weighs about 46lb per cubic foot, is not considered to be as strong as other elms, but is used for tool handles, wheel hubs etc[46, 61, 82, 149, 227, 229].

dwatta None known

propta Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days[200]. Stored seed does not germinate so well and should be sown in early spring[200]. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Plants should not be allowed to grow for more than two years in a nursery bed since they form a tap root and will then move badly. Layering of suckers or coppiced shoots[200].

nwatta Landscape Uses:Specimen, Street tree. Prefers a fertile soil in full sun[188], but can be grown in any soil at least moderate quality so long as it is well drained[1]. A fast-growing tree in its native range[227], but this species does not thrive in Britain[1]. Closely related to *U. thomasi*[11]. Susceptible to 'Dutch elm disease', a disease that has destroyed the greater part of all the elm trees growing in Britain. The disease is spread by means of beetles. Mature trees killed back by the disease will often regrow from suckers, but these too will succumb when they get larger. There is no effective cure (1992) for the problem, but most E. Asian, though not Himalayan, species are resistant (though not immune) to the disease so the potential exists to use these resistant species to develop new resistant hybrids with the native species[200]. The various species of this genus hybridize freely with each other and pollen is easily saved, so even those species with different flowering times can be hybridized[200]. Special Features: Attracts birds, North American native, Inconspicuous flowers or blooms.

## 7.2.319 *Physalis virginiana*

Virginia Ground Cherry

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Physalis virginiana* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked[46, 105, 170]. The fruit is best after it has been touched by a frost[257]. The plant conveniently wraps up each fruit in its own 'paper bag' (botanically, the calyx) to protect it from pests and the elements. This calyx is toxic and should not be eaten.

tcanta MiscellanyNone known

dwatta Cancer MiscellanyExtracts from the plant have shown anticancer activity[218]. An infusion of the whole plant has been used in the treatment of dizziness[257].

propta Seed - sow March/April in a greenhouse only just covering the seed. Germination usually takes place quickly and freely. Prick out the seedlings into individual pots of fairly rich soil when they are large enough to handle and plant them out after the last expected frosts. Consider giving them some protection such as a cloche until they are growing away well. Diurnal temperature fluctuations assist germination[170]. Division in spring[111]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in early summer[111]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in any well-drained soil in full sun or light shade[200]. This plant has been growing successfully with us in Cornwall since 1990, though it is not setting fruit[K].

## 7.2.320 *Leymus condensatus*

Giant Wild Rye

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 2 m hkuc htut cyutli hgatkuyctup hwicli hyishrasjlutnyik hpa7tli flatpriklwissliphsom hpa7tmwatli xre7t hjonli

drutta *Leymus condensatus* is a PERENNIAL growing to 2 m (6ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: SeedEdible Uses: Seed - cooked[22, 46, 105, 161]. It can be ground into a flour and used to make bread[61, 95, 177]. The seed is rather small and rather difficult to extract[K].

tcanta Brush Thatching WeavingThe leaves are used for making mats, rope, paper etc. The stems are used for thatching roofs etc[257]. The roots can be tied together and used as a hair comb[257].

dwatta OphthalmicA decoction or infusion of the leaves has been used as a wash for sore eyes[257]. The dried leaves have been used to scrape pimples from the underside of the eyelid[257].

propta Seed - sow mid spring in situ and only just cover the seed[162]. Germination should take place within 2 weeks. If the supply of seed is limited, it can also be sown in mid spring in a cold frame. Only just cover the seed. When large enough to handle, prick the seedlings out into individual pots and plant them out in summer[K] Division in spring or summer[162]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in most soils, preferring a sandy soil and a sunny position[1, 162]. Established plants are drought resistant[61]. Plants are tolerant of saline and alkaline soils[61]. A very variable species[1], it is possibly suitable for cultivation as a perennial cereal[95].

## 7.2.321 *Rosa laevigata*

Cherokee Rose

6 tlin 9 cyuc 2 kcaak 0 tcan 3 dwat 6 m hkuc htut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Rosa laevigata* is an evergreen Shrub growing to 6 m (19ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower

tcanta WoodWood - light, soft, coarse grained, not very durable. Used for construction, pulp, etc[61].

dwatta None known

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Landscape Uses:Christmas tree, Pest tolerant, Screen, Specimen. Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Plants are very shade tolerant, especially when young, but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions, down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. New growth of the side shoots starts in April and this is very susceptible to damage by late frosts[11, 185]. The terminal buds do not open until mid-May and usually escape damage[185]. Trees are fairly fast growing when young, sending up new growth of 60cm a year from the age of about 6 years[185]. Side shoots grow with equal vigour, however and the tree often loses apical dominance[185]. Trees grow best in the Perthshire valleys of Scotland[11]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. The flowers are produced in axils of the previous year's shoots[275]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Special Features:Not North American native, There are no flowers or blooms.

## 7.2.330 *Aphananthe aspera*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 20 m hkuc hmimhtut cyutli kyuctup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Aphananthe aspera* is a deciduous Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to May, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit[105, 177]. The fruit is about 6 - 8mm in diameter[200].

tcanta Fibre Paper Sandpaper WoodThe leaves, gathered in autumn, are used as a sandpaper on wood[46, 61]. The fibre from the bark is used for manufacturing ropes and staple rayon[266]. The wood is fine and strong[266].

dwatta None known

propta Seed - it probably requires 2 - 3 months stratification. It is best to sow the seed as soon as it is ripe in a cold frame, otherwise sow as soon as possible in the year. Remove any pulp from the seed before sowing it[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter before planting them out in late spring or early summer, after the last expected frosts.

nwatta Succeeds in most soils, including dry gravels, but prefers a deep fertile soil[200]. Plants are frost tender when young but they are able to regrow from the base if cut back[11]. A tree growing outdoors at Kew Botanical Gardens has reached a height of 8 metres[111].

## 7.2.331 *Juniperus recurva*

Himalayan Juniper

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 12 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwisslip hpa7tmwatli nyanhjen hjonli

drutta *Juniperus recurva* is an evergreen Tree growing to 12 m (39ft) by 6 m (19ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in October. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. The cones are up to 11mm long and 6mm wide[200].

tcanta Essential IncenseThe wood and leaves are used as an incense[272]. The resinous twigs are burnt as an incense[2, 146]. The leaves contain about 1.7% essential oil[272].

dwatta EmeticSmoke from the green wood is emetic and produces long-continued vomiting[240].

propta The seed requires a period of cold stratification. The seed has a hard seedcoat and can be very slow to germinate, requiring a cold period followed by a warm period and then another cold spell, each of 2 - 3 months duration[78, 81]. Soaking the seed for 3 - 6 seconds in boiling water may speed up the germination process[11]. The seed is best sown as soon as it is ripe in a cold frame. Some might germinate in the following spring, though most will take another year. Another possibility is to harvest the seed 'green' (when the embryo has fully formed but before the seedcoat has hardened). The seedlings can be potted up into individual pots when they are large enough to handle. Grow on in pots until large enough, then plant out in early summer. When stored dry, the seed can remain viable for several years[1]. Cuttings of mature wood, 5 - 10cm with a heel, September/October in a cold frame. Plant out in the following autumn[1, 78]. Layering in September/October. Takes 12 months[78].

nwatta Succeeds in most soils if they are well drained, preferring a neutral or slightly alkaline soil[1, 11] and succeeding on chalk[200]. Prefers a humid sheltered site, doing well in areas with high rainfall[200]. Does not succeed in dry areas[200]. Unlike most members of the genus, this species grows better in the wetter western part of Britain[11]. A very ornamental plant[1] but slow growing in Britain, even young trees fail to average 25cm a year[185]. Plants are resistant to honey fungus[88]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.332 *Platycarya strobilacea*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 12 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Platycarya strobilacea* is a deciduous Tree growing to 12 m (39ft) by 12 m (39ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177]. A famine food, only used when all else fails[179].

tcanta Dye Fuel IncenseA black dye is obtained from the fruits. It is used for dyeing cloth[46, 61, 109]. A black dye is obtained from the bark. It is used for dyeing nets[46, 61]. (It quite possibly contains tannin which will also help to preserve the nets[K].) The root is very fragrant when it is burnt. It is used in baths[178]. The wood is a good fuel[178].

dwatta None known

propta The seed is best sown as soon as it is ripe in a cold frame. Stored seed requires a period of cold stratification[200]. When they are large enough to handle, prick the

March to May, and the seeds ripen from October to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

**kcakta Edible Parts:** Edible Uses: CondimentA vanilla flavouring is obtained as a by-product of other resins that are released from the pulpwood[200].

**tcanta Dye Herbicide Resin WoodA** tan or green dye is obtained from the needles[168]. The needles contain a substance called terpene, this is released when rain washes over the needles and it has a negative effect on the germination of some plants, including wheat[201]. This tree is a source of resin but it is not exploited commercially[64]. The flow of resin checks too quickly and labour costs are too high[227]. Oleo-resins are present in the tissues of all species of pines, but these are often not present in sufficient quantity to make their extraction economically worthwhile[64]. The resins are obtained by tapping the trunk, or by destructive distillation of the wood[4, 64]. In general, trees from warmer areas of distribution give the higher yields[64]. Turpentine consists of an average of 20% of the oleo-resin[64] and is separated by distillation[4, 64]. Turpentine has a wide range of uses including as a solvent for waxes etc, for making varnish, medicinal etc[4]. Rosin is the substance left after turpentine is removed. This is used by violinists on their bows and also in making sealing wax, varnish etc[4]. Pitch can also be obtained from the resin and is used for waterproofing, as a wood preservative etc. Wood - weak, brittle, coarse grained, resinous, not durable[61, 82, 171, 229]. The wood weighs 34lb per cubic foot[227]. Used for lumber, cooperage, crates, the interior of buildings, pulp etc[61, 82, 171, 229].

**dwatta** The turpentine obtained from the resin of all pine trees is antiseptic, diuretic, rubefacient and vermifuge[4]. It is a valuable remedy used internally in the treatment of kidney and bladder complaints and is used both internally and as a rub and steam bath in the treatment of rheumatic affections[4]. It is also very beneficial to the respiratory system and so is useful in treating diseases of the mucous membranes and respiratory complaints such as coughs, colds, influenza and TB[4]. Externally it is a very beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils etc and is used in the form of liniment plasters, poultices, herbal steam baths and inhalers[4].

**propta** It is best to sow the seed in individual pots in a cold frame as soon as it is ripe if this is possible otherwise in late winter. A short stratification of 6 weeks at 4°C can improve the germination of stored seed[80]. Plant seedlings out into their permanent positions as soon as possible and protect them for their first winter or two[11]. Plants have a very sparse root system and the sooner they are planted into their permanent positions the better they will grow[K]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm[200]. We actually plant them out when they are about 5 - 10cm tall. So long as they are given a very good weed-excluding mulch they establish very well[K]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Cuttings. This method only works when taken from very young trees less than 10 years old. Use single leaf fascicles with the base of the short shoot. Disbudding the shoots some weeks before taking the cuttings can help. Cuttings are normally slow to grow away[81].

**nwatta Agroforestry Services:** Windbreak Industrial Crop: Hydrocarbon Management: Standard Regional TimberLandscape Uses: Pest tolerant, Aggressive surface roots possible, Specimen. Thrives in a light well-drained sandy or gravelly loam[1, 11]. Dislikes poorly drained moorland soils[1]. Established plants tolerate drought[200]. This species comes from an area with long hot summers and mild winters[229]. It is fast growing and is cultivated as a timber tree on a small scale in Europe[50]. It does not grow well in Britain, however[1]. The trees are fully hardy in this country except when they are young[81]. Rarely found in Britain, the few trees that have been planted are all found in southern England and are all growing well[185]. It is proving to be a fairly vigorous tree here, averaging 30cm annual

increase in height for at least the first 50 years[185]. Trees can produce cones when only 10 years old, though 30 - 40 years is more usual[229]. Good crops are produced most years in the wild[229]. The cones are 5- 15cm long, they open and shed their seed whilst still attached to the tree and usually persist on the tree for a further year[82, 226]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200]. Leaf secretions inhibit the germination of seeds, thereby reducing the amount of plants that can grow under the trees[18]. Plants in this genus are notably susceptible to honey fungus[200]. **Special Features:** Attracts birds, North American native, Inconspicuous flowers or blooms.

## 7.2.328 Pterocarya fraxinifolia

**Caucasian Wingnut**  
6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 30 m hkuc  
htut cyutli tcup hwicli jlutnyik hpa7tli flatprikwis hpa7tmwatli hjonli

**drutta** Pterocarya fraxinifolia is a deciduous Tree growing to 30 m (98ft) by 20 m (65ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** SeedEdible Uses: Seed[2, 105]. No more details are given but the seed is very small and would be very fiddly to use[K].

**tcanta Weaving WoodThe** bast from the bark is used for weaving hats etc[74]. Wood - soft, hard to split. Used for matches, shoes etc[46, 61].

**dwatta DiaphoreticDiaphoretic**[74].

**propta Seed** - best sown as soon as it is ripe in a cold frame[80, 113]. Pre-soak stored seed for 24 hours in warm water[80] then cold stratify for 2 - 3 months[98, 113]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer of the following year[240]. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature shoots, November in a frame. Only use vigorous shoots[113]. Layering. Division of suckers in the dormant season[188].

**nwatta** Prefers a sunny position in a rich strong loam with abundant moisture at the roots[11, 200]. Grows well by water[11]. Succeeds in areas that do not experience prolonged winter temperatures below about -12°C[200], but young plants and the young shoots of older trees can be cut back by winter frosts[11]. A very ornamental tree[1], it fruits freely in Britain[11]. The leaves are sweetly resinous[245]. The deeply furrowed bark is aromatic[245]. Produces suckers profusely[98]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.329 Abies firma

**Momi Fir Japanese Fir**  
6 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 30 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprik hpa7tmwatli hjonli

**drutta** Abies firma is an evergreen Tree growing to 30 m (98ft 5in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from April to May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta Edible Parts:** SeedEdible Uses: Seed - roasted[105, 177]. No more details are given, but the seed is very small and fiddly to utilize[K].

from June to July, and the seeds ripen from August to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta Edible Parts:** Fruit SeedEdible Uses: Fruit - raw or cooked[177]. The pear-shaped fruit is up to 4cm long[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Sugar can be extracted from the fruit, it is also used to ferment rose wine[266]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The seed is a good source of vitamin E, it can be ground and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102].

**tcanta Tannin**The root bark contains tannin[266].

**dwatta** Antibacterial Anticholesterolemic Astringent Cancer Carminative Depurative Diuretic Dysentery Emmenagogue Infertility Kidney Stomachic Urinary VulneryThe leaves are a famous vulnery[218]. The fruits, root and leaves are emmenagogue and depurative[147]. Their use stabilizes the kidneys[147]. A decoction is used in the treatment of chronic dysentery, urinary tract infections, wet dreams, prolapse of the uterus, menstrual irregularities and traumatic injuries[147]. The root bark is astringent and used in the treatment of diarrhoea and menorrhagia[218]. The dried fruits are antibacterial, anticholesterolemic, astringent, carminative, diuretic and stomachic[176, 178, 218, 238]. They are used internally in the treatment of urinary dysfunction, infertility, seminal emissions, urorrhoea, leucorrhoea and chronic diarrhoea[238]. The root is used in the treatment of uteral prolapse[218]. The flowers are used in the treatment of dysentery and to restore hair cover[218]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

**propta Seed.** Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbibed). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

**nwatta** Succeeds in most soils[11], preferring a circum-neutral soil and a sunny position[200]. Grows well in heavy clay soils. Dislikes water-logged soils[200]. A very ornamental plant[1], but it is not very hardy in Britain and only succeeds outside in the warmer parts of the country[11]. It can be cut back to the ground even in southern England in cold winters, though it will usually resprout from the base[260]. It is the state flower of Georgia[219] and is also the parent of several modern garden cultivars[219]. The flowers have a clove-like fragrance[245]. If any pruning is necessary then this should be carried out immediately after the plant has

finished flowering[219]. Grows well with alliums, parsley, mignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. Hybridizes freely with other members of this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.322 Dianthus caryophyllus

**Carnation, Clove Pink, Border Carnation**  
6 tin 8 cyuc 2 kcaak 0 tcan 2 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wissliphos hpa7tmwatli fyifkre7t hjonli

**drutta** Dianthus caryophyllus is a PERENNIAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 8 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Lepidoptera (Moths and Butterflies). The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

**kcakta Edible Parts:** FlowersEdible Uses: Condiment-The flower petals have a strong smell of cloves and are candied, used as a garnish in salads, for flavouring fruit, fruit salads etc. They can also be used as a substitute for rose petals in making a syrup[183, 238]. The petals should be removed from the calyx and their bitter white base should be removed[183].

**tcanta Essential SoapAn** essential oil is obtained from the flowers[46, 171]. It is used in perfumery. 500kg of flowers produce 100g of oil[61]. The flowers are harvested when they are fully open in the morning, preferably after 3 hours exposure to sunlight[238]. The flower heads are dried and used in pot-pourri, scented sachets and cosmetic products[238, 268]. The plant is quite rich in saponins. The leaves can be simmered in water and this water can then be used as a soap for cleaning the skin, clothes etc[201].

**dwatta Antispasmodic Cardiotonic Diaphoretic** Febrifuge Nerve StimulantCarnation flowers are an aromatic, stimulant herb that has been used in tonic cordials in the past to treat fevers, though this use is now obsolete[238]. It is traditionally prescribed in European herbal medicine to treat coronary and nervous disorders[254]. The flowers are considered to be alexiteric, antispasmodic, cardiotonic, diaphoretic and nerve[240]. The plant has been used as a vermifuge in China[240].

**propta Seed** - sow spring in slight heat in a greenhouse[1]. The seed usually germinates in 2 - 3 weeks at 15°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Layering in July[1]. Cuttings of non-flowering basal shoots, June/July in a frame[200]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

**nwatta Landscape Uses:**Border, Container, Rock garden, Seashore, Specimen. Succeeds in a sunny position in most good soils[11, 200] tolerating a pH range from 6 to 8 but disliking acid soils[200]. A very tolerant plant, succeeding in the salt laden air and strong winds of the coast as well as in the sulphur polluted air of cities[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to about -10°C[200]. A very ornamental plant[1], the carnation is widely cultivated in the flower garden and is grown commercially in France for its essential oil[46]. There are many named varieties[200]. The flowers of the species have a rich clove-like perfume, though almost no scent is present in the orange and yellow-flowering cultivars[245]. The flowers are very attractive to butterflies and moths[17]. Plants are prone to mildew or leaf spot in humid climates[201]. **Special Features:**Edible, Not North American native, Suitable for cut flowers, Fragrant flowers.

## 7.2.323 *Rosa banksiae*

Banksia Rose

6 tlin 9 cyuc 2 kcaak 0 tcan 1 dwat 10 m hkuc htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Rosa banksiae* is a deciduous Shrub growing to 10 m (32ft) by 12 m (39ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Fruit SeedEdible Uses: Fruit - raw or cooked. The fruit is about 7mm in diameter[200], but there is only a thin layer of flesh surrounding the many seeds[K]. Some care has to be taken when eating this fruit, see the notes above on known hazards. The seed is a good source of vitamin E, it can be ground and mixed with flour or added to other foods as a supplement[102, 183]. Be sure to remove the seed hairs[102].

tcanta Dye Preservative TanninTannin obtained from the root bark is used as a brown dye for rope and also to preserve and strengthen rope that is to be immersed in water[46, 61, 109].

dwatta Anthelmintic Astringent Bitter Cancer Tonic VulneraryThe plant is rich in tannins and is used as an astringent[218]. The root is anthelmintic, astringent, bitter and tonic[240]. The leaves are said to be a good vulnerary[240]. The fruit of many members of this genus is a very rich source of vitamins and minerals, especially in vitamins A, C and E, flavanoids and other bio-active compounds. It is also a fairly good source of essential fatty acids, which is fairly unusual for a fruit. It is being investigated as a food that is capable of reducing the incidence of cancer and also as a means of halting or reversing the growth of cancers[214].

propta Seed. Rose seed often takes two years to germinate. This is because it may need a warm spell of weather after a cold spell in order to mature the embryo and reduce the seedcoat[80]. One possible way to reduce this time is to scarify the seed and then place it for 2 - 3 weeks in damp peat at a temperature of 27 - 32°C (by which time the seed should have imbeded). It is then kept at 3°C for the next 4 months by which time it should be starting to germinate[80]. Alternatively, it is possible that seed harvested 'green' (when it is fully developed but before it has dried on the plant) and sown immediately will germinate in the late winter. This method has not as yet(1988) been fully tested[80]. Seed sown as soon as it is ripe in a cold frame sometimes germinates in spring though it may take 18 months. Stored seed can be sown as early in the year as possible and stratified for 6 weeks at 5°C[200]. It may take 2 years to germinate[200]. Prick out the seedlings into individual pots when they are large enough to handle. Plant out in the summer if the plants are more than 25cm tall, otherwise grow on in a cold frame for the winter and plant out in late spring. Cuttings of half-ripe wood with a heel, July in a shaded frame. Overwinter the plants in the frame and plant out in late spring[78]. High percentage[78]. Cuttings of mature wood of the current seasons growth. Select pencil thick shoots in early autumn that are about 20 - 25cm long and plant them in a sheltered position outdoors or in a cold frame[78, 200]. The cuttings can take 12 months to establish but a high percentage of them normally succeed[78]. Division of suckers in the dormant season. Plant them out direct into their permanent positions. Layering. Takes 12 months[11].

nwatta Succeeds in most soils[11], preferring a circum-neutral soil[200]. Grows well in heavy clay soils. Dislikes water-logged soils[200]. Requires a very sunny position if it s to flower well[11, 245]. This species does not thrive in the cooler moister parts of Britain, growing best in the south-east of the country[11]. It is best given a position on a sunny sheltered wall[219]. A very ornamental plant[1]. After planting out, it takes a few years to settle down and commence flowering[219]. Flowers are produced mainly on wood that is 2 - 3 years old[219]. The flowers have a violet-like perfume[245]. Grows well with alliums, parsley, hignonette and lupins[18, 20]. Garlic planted nearby can help protect the plant from disease and insect predation[18, 20]. Grows badly with boxwood[18]. Hybridizes freely with other members of

this genus[80]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.324 *Ephedra viridis*

Mormon Tea, Brigham Tea, Long Leaf Ephedra, Mountain Joint Fir, Mormon Tea, Ephedra

6 tlin 11 cyuc 2 kcaak 0 tcan 3 dwat 1.8 m hkuc htut cyutli hgatkyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta *Ephedra viridis* is an evergreen Shrub growing to 1.8 m (6ft). See above for USDA hardiness. It is hardy to UK zone 9. It is in leaf all year, in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Fruit SeedEdible Uses: TeaFruit - raw. A sweet flavour. Seed - cooked. A bitter flavour; it is roasted and ground into a powder and used to make a bread or mush[183]. A delicious tea is made by steeping the green or dried twigs in boiling water[183, 257]. The flavour is said to be improved if the stems are roasted first[183].

tcanta DyeThe twigs, boiled with alum, produce a light tan dye[257].

dwatta Blood purifier Diuretic Kidney Poultice Stomachic Tonic VDThis plant has a wide reputation as a cure for syphilis[216]. A strong decoction of the stems was drunk and a poultice of the pulverized or boiled stems applied to the sores[257]. The stems are blood purifier, diuretic and tonic[257]. An infusion has been used in the treatment of coughs and colds, anaemia, rheumatism, stomach ulcers and other disorders, kidney problems[257]. The dried, powdered stems are used as a dressing on sores and burns[257]. The stems of most members of this genus contain the alkaloid ephedrine and are valuable in the treatment of asthma and many other complaints of the respiratory system[K]. The whole plant can be used at much lower concentrations than the isolated constituents - unlike using the isolated ephedrine, using the whole plant rarely gives rise to side-effects[254]. Ephedra does not cure asthma but in many cases it is very effective in treating the symptoms and thus making life somewhat easier for the sufferer. The stems can be used fresh or dried and are usually made into a tea, though they can also be eaten raw[K]. The young stems are best if eating them raw, though older stems can be used if a tea is made[K]. The stems can be harvested at any time of the year and are dried for later use[238].

propta Seed - best sown as soon as it is ripe in the autumn in a greenhouse[200]. It can also be sown in spring in a greenhouse in a sandy compost[K]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on for at least their first winter in a greenhouse. Plant out in the spring or early summer after the last expected frosts and give some protection in their first winter[K]. Division in spring or autumn[238]. Layering.

nwatta Landscape Uses:Erosion control, Ground cover, Massing, Rock garden. Requires a well-drained loamy soil and a sunny position[11]. Established plants are drought resistant and are also lime tolerant[200]. This species is not very hardy in Britain, it succeeds well in a cold greenhouse but is often killed outdoors by a combination of cold and wet conditions[200]. Dioecious, male and female plants must be grown if fruit and seed is required.Special Features:Attractive foliage, North American native.

## 7.2.325 *Tsuga heterophylla*

Western Hemlock

6 tlin 7 cyuc 1 kcaak 0 tcan 2 dwat 70 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflat-prikliwis hpa7tmwatli hjonli

drutta *Tsuga heterophylla* is an evergreen Tree growing to 70 m (229ft) by 15 m (49ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from April to May, and the seeds ripen from

October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Inner barkEdible Uses: Condition Gum TeaInner bark - raw or cooked[213, 257]. It can be dried, ground into a powder and then used as a thickening in soups etc or mixed with cereals when making bread[161]. It has also been used as a sweetener for other foods[257]. The inner bark was often cooked and then dried for use in the winter[256]. At its best in spring[172], it was one of the staple foods of the Alaskan Indians[82]. An emergency food, it is only used when all else fails[183]. The leaves and twigs yield 'spruce oil', used commercially to flavour chewing gum, soft drinks, ice cream etc[183]. Pitch, obtained from crevices in the bark, has been chewed as a gum[257]. The leaves and young shoots have been chewed as an emergency food to keep one alive when lost in the woods[257]. A herbal tea is made from the leaves and shoot tips[172, 183]. These tips are also an ingredient of 'spruce beer'[183].

tcanta Dye Fuel Gum Hedge Hedge Parasiticide Resin Rust Tannin WoodYields a resin similar to *Abies balsamea*, it is gathered by incisions in the trunk or by boiling the wood[46, 61, 64]. The bark contains 8 - 18% tannin and is a major source of tannin in America[46, 82, 171, 226]. A reddish-brown dye is obtained from the bark[21, 46, 257]. A decoction of the bark has been used to clean rust off iron and steel[257]. A pitch (called hemlock pitch), is obtained by distillation of the young branches[46]. The pitch is rubbed on the hair to get rid of head lice[257]. Tolerant of light trimming, plants can be grown as a hedge[81]. This species makes a good hedge in Britain[124, 200]. Wood - light, hard, tough, easy to work. Commercially superior to other members of this genus, it is an important tree for construction, the outside of buildings etc and for carving into spoons etc[46, 61, 82, 171, 226, 229]. It is also a major source of pulp[226]. The wood makes a slow-burning fuel and so can be used to bank up a fire to keep it burning overnight[257].

dwatta Astringent Diaphoretic Diuretic Parasiticide Poultice SkinWestern hemlock was commonly employed medicinally by several native North American Indian tribes who used it to treat a variety of complaints[257]. It is little, if at all, used in modern herbalism. The bark is astringent, diaphoretic and diuretic[21]. A decoction of the pounded bark has been used in the treatment of haemorrhages, tuberculosis and syphilis[257]. The boiled bark, combined with liquorice fern (*Polypodium glycyrrhiza*), has been used in the treatment of haemorrhages[257]. An infusion of the inner bark or twigs is helpful in the treatment of kidney or bladder problems[21]. It can also be used as a good enema for treating diarrhoea and as a gargle or mouthwash for mouth and throat problems[21]. Externally, it can be used as a wash on sores and ulcers[21, 257]. A poultice of the plant has been applied to bleeding wounds[257]. A moxa of the twigs has been used to get rid of warts[257]. The powdered bark can be put into shoes for tender or sweaty feet or for foot odour[21]. The gum obtained from the trunk has been applied to cuts[257]. It has been applied to the skin to prevent chapping and sunburn[257]. A poultice of the chewed leaves has been used in the treatment of burns[257].

propta Seed - it germinates better if given a short cold stratification[80, 113] and so is best sown in a cold frame in autumn to late winter. It can also be sown in early spring, though it might not germinate until after the next winter. If there is sufficient seed, an outdoor sowing can be made in spring[78]. Pot-grown seedlings are best potted up into individual pots once they are large enough to handle - grow them on in a cold frame and plant them out in early summer of the following year. Trees transplant well when they are up to 80cm tall, but they are best put in their final positions when they are about 30 - 45 cm or less tall, this is usually when they are about 5 - 8 years old[200]. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200].

nwatta Landscape Uses:Hedge, Aggressive surface roots possible, Screen, Specimen, Woodland garden. An easily grown plant, it thrives best when growing in a deep well-drained soil in the western parts of Britain where it appreci-

ates the higher rainfall[11]. However, it succeeds in most soils and positions, being especially good on acidic sandy soils[81] but also tolerating some lime[11] so long as there is plenty of humus in the soil[208]. Plants are very shade tolerant when young, but need more sunlight as they grow older[81, 200]. Plants are thin and poor when grown in dry or exposed places[200]. Occasionally cultivated for its timber in Britain, it can grow 60 - 150cm per year[11, 185]. New growth takes place from mid-May to mid-September, at first it hangs downwards but begins to straighten towards the end of the season[185]. There are trees more than 50 metres tall in Britain[200]. Trees live for several centuries in the wild and often produce large quantities of seed[229]. Plants often form pure stands and cast a dense shade, thus preventing the regeneration of other trees whilst being able to reproduce itself[226]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:North American native, Inconspicuous flowers or blooms.

## 7.2.326 *Nothofagus pumilio*

Lenga

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 40 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik hpa7tmwatli hjonli

drutta *Nothofagus pumilio* is a deciduous Tree growing to 40 m (131ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Inner bark SapEdible Uses: The sap and scrapings are eaten in spring[69]. The term scrapings probably refers to the inner bark. Inner bark is often dried, ground into a powder and then used as a thickener in soups etc or added to cereals when making bread.

tcanta Lighting WoodUsed for making torches[69]. This is probably a reference to the bark, since this is the part used in *N. betuloides*. Wood - useful[11]. No further details are given.

dwatta None known

propta The seed is best sown as soon as it is ripe in a cool greenhouse or cold frame. Spring-sown seed requires 2 - 3 months stratification at 1 - 5°C[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed must not be allowed to dry out according to one report[80] whilst another says that the seed can be stored dry at 2°C for long periods[200]. Cuttings of half-ripe wood, 6 - 10cm with a heel, July/August in a frame[78]. Layering.

nwatta Prefers an open well-drained loamy soil in a sunny position[1, 200]. Succeeds on most soils but dislikes calcareous soils[11]. Prefers a pH between 5 and 7, but dislikes acid peats[200]. Prefers cool wet summers in temperate maritime zones[200]. This species is closely related to *N. antarctica*[11]. Trees have poor wind resistance in Britain, probably because they grow so fast[11]. Plants at Crarae in western Scotland are very hardy but fairly slow growing[191]. Trees up to 4 metres tall can be successfully established, though the optimum size for transplanting is about 30 - 80cm. The roots are very sensitive to desiccation and extreme care should be taken when transplanting them[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.327 *Pinus taeda*

Loblolly Pine

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 40 m hkuc htut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprik hpa7tmwatli dyat hjonli

drutta *Pinus taeda* is an evergreen Tree growing to 40 m (131ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from

drutta Iberis amara is a ANNUAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe seeds are sometimes used as a source of mustard[61, 177, 183]. Pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or vinegar, or adding salt, inhibits the enzyme and produces a mild bitter mustard[238].

tcanta None known

dwatta Antiarrhythmic Antiasthmatic Antirheumatic Antiscorbutic HomeopathyLittle used in modern herbalism, rocket candytuft is a bitter-tasting tonic, aiding digestion and relieving wind and bloating[254]. It is traditionally taken to treat gout, rheumatism and arthritis[254]. All parts of the plant are antirheumatic and antiscorbutic[61]. The seeds are considered very useful in the treatment of asthma, bronchitis and dropsy[4, 240]. The plant is gathered in the summer and can be dried for later use[254]. The seeds are harvested when fully ripe[254]. A common homeopathic remedy is made from the seeds[4].

propta Seed - sow spring in situ for summer flowering or late summer in situ for a spring flowering[200]. The seed germinates within 3 weeks.

nwatta Easily grown in a good, well-drained ordinary garden soil in a sunny position[1]. Prefers a calcareous soil but tolerates mildly acid soils[1]. Succeeds in poor soils[200] and on dry walls[1]. A very ornamental plant[1]. A fast growing plant[188], do not grow the plants too close together[1]. The flowers are sweetly scented[245].

## 7.2.410 Ilex macropoda

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Ilex macropoda is a deciduous Tree growing to 13 m (42ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen from October to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea is made from the leaves[177].

tcanta None known

dwatta None known

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years.

nwatta Succeeds in most soils so long as they are not water-logged[200]. This species is closely related to I. mon-

tana[200]. Resents root disturbance, especially as the plant grows older[1, 11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.411 Paeonia potaninii

Tree Peony

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyikrip hpa7tli flatpriklwisslip hpa7tmwatli fyfixre7t hjonli

drutta Paeonia potaninii is a deciduous Shrub growing to 0.6 m (2ft) by 1.5 m (5ft in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FlowersEdible Uses: The following use is for P. suffruticosa. It quite probably also applies to this closely-related species.[K - see 214]. Flowers - cooked[46, 61, 177]. The fallen flower petals are parboiled and sweetened for a teatime delicacy, or cooked in various dishes[183].

tcanta None known

dwatta Analgesic Antibacterial Antiinflammatory Antispasmodic Cholera DysenteryThe bark obtained from the root has an antimicrobial effect upon various bacteria, including Escherichia coli, typhoid, cholera, Staphylococcus aureus, streptococcus hemolyticus and Pneumococci[250]. The root is also anti-inflammatory and has been used with success in the treatment of arthritic joint swelling[250]. The root is also analgesic, sedative and anticonvulsant, it has a high success rate in the treatment of dysentery and can also be used to treat allergic rhinitis[250]. The plant is used internally in the treatment of fevers, boils, menstrual disorders, nosebleeds, ulcers, irritability and gastro-intestinal infections[238]. This remedy should only be used under the supervision of a qualified practitioner[238]. The herb acts as a synergist when used with liquorice (Glycyrrhiza spp)[218]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division of suckers in the dormant season. They are probably best potted up and grown on in light shade in a greenhouse until they are established.

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1]. Prefers a limy soil and a sheltered position[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Hardy to about -20°C[184], plants do better in the north of Britain than they do in the south and are generally best if given an open northerly aspect[11]. Closely related to P. delavayi, differing mainly in the size of the flowers, its more dissected leaves and its suckering habit[11]. This species is not recognised by Chinese botanists, who hold that it is no more than a form of P. delavayi[214]. A very ornamental plant[1]. It grows best in

areas with long hot summers[1] and requires an airy position because it is very subject to fungal attack[11]. Plants in this genus are notably susceptible to honey fungus[200]. Plants come into growth early in the year and are then subject to damage by late frosts, they are therefore best sited in a position that is shaded from the early morning sun[11]. The branches are brittle and very subject to wind damage, especially when young[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. The plant does not really need much pruning apart from removing dead or diseased stems. It is, however, very tolerant of pruning and can be cut right back to ground level if it requires rejuvenation[200]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1]. Cultivated in China as a medicinal plant[214].

### 7.2.412 *Micromeria juliana*

Savory

6 tlin 9 cyuc 1 kcak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta *Micromeria juliana* is a deciduous Shrub growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentLeaves are used as a food flavouring[183], a substitute for savory (*Satureia* spp.).

tcanta None known

dwatta Diuretic KidneyUsed in the treatment of kidney and bladder ailments[148].

propta Seed - sow spring in a greenhouse[188]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood with a heel, July/August in a frame[188].

nwatta Prefers an open position in a well-drained soil[1]. Succeeds in poor soils[200]. Requires a sunny position[188].

### 7.2.413 *Sedum rupestre*

Crooked Yellow Stonecrop

6 tlin 9 cyuc 1 kcak 2 tcan 0 dwat 0.1 m hkuc  
hmimhtut cyutli hqatkyuctcup hwicli hrasjlutnyik hpa7tli  
prikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Sedum rupestre* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[4, 52, 115, 183]. A slightly astringent sour taste makes this plant a useful addition to a green tossed salad and it can also be added to soups or used as a vegetable[9, 183]. Used in salads, it has a fine relish[2].

tcanta Agroforestry Uses: A good ground cover plant for a sunny position[188 ]. The somewhat open growth habit makes it suitable for growing with larger bulbs such as some

lilies[K ]. Place starter plants 20 - 30cm apart in order to obtain rapid massing as a ground cover[352 ]. The plant is used on 'green roof' and 'green wall' systems in Korea. These systems are incorporated into the structure of the building, providing habitats for wildlife as well as insulating the building and helping to improve the environment. The cultivar 'Blue Spruce' has been specifically mentioned[1240 , 1241 ]

dwatta None known

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil[200]. Requires a sunny position[188, 200]. The plant flowers best when grown in a sunny position, though it also succeeds in semi-shade[219]. Established plants are very drought tolerant[200], they grow well in dry soils and can also be grown in a crevice on a wall[200, 219]. This species is hardy to about -15°C[200]. A mat forming plant, it spreads rapidly and it is not suitable for the rockery[83]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. The plant is heat tolerant in zones 9 through 6. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

### 7.2.414 *Orychophragmus violaceus*

6 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis  
hpa7tmwatli xre7t hjonli

drutta *Orychophragmus violaceus* is a ANNUAL/BIENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[200].

tcanta None known

dwatta None known

propta Seed - sow in situ in spring or early summer.

nwatta Succeeds in a fertile well-drained soil in a sunny position[200]. Plants are not very cold-tolerant[188], but they can be overwintered outdoors in areas where winter temperatures do not fall below about -5°C[200]. This species is cultivated as a vegetable in China[200].

### 7.2.415 *Chionographis japonica*

6 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 0.3 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis



hpa7tmwatli xre7t hjonli

drutta Chionographis japonica is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Leaves and young plants[177]. No more details are given.

tcanta None known

dwatta None known

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse as soon as it is ripe if possible otherwise in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or after flowering in the summer.

nwatta Prefers a moisture-retentive but well-drained humus-rich loamy soil and a position in light dappled shade[1, 200]. It is well suited to the woodland garden[200]. Plants are hardy to about -15°C but they often require some protection in the winter, especially in areas where cold temperatures are prolonged[200].

### 7.2.416 Paeonia brownii

Brown's Peony

6 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 0.5 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyikfrp hpa7tli flatprik-wis hpa7tmwatli fyifxre7t hjonli

drutta Paeonia brownii is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Root. A liquorice flavour[105, 161].

tcanta BeadsThe seeds can be used as beads in necklaces etc[257].

dwatta Antitussive Cardiac Febrifuge Laxative Pectoral Poulitce TBThe root is cardiac, febrifuge, laxative and pectoral[257]. A decoction has been used by some native North American Indian tribes in the treatment of pneumonia, tuberculosis, VD, nausea, indigestion, coughs, diarrhoea and kidney troubles[207, 257]. A decoction of the sun-dried roots has been used to help people put on weight[257]. A decoction of the root has been used as a liniment on swellings[257]. An infusion of the root has been used as a wash for sore eyes[257]. A powder of the dried and ground root can be used as a dressing on cuts, wounds, burns and sores[257]. A poultice of the crushed roots has been used to treat boils, deep cuts and wounds[257]. A cold infusion of the seeds has been used as a cough medicine[257]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have

a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[1, 200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species requires an extremely well-drained soil[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. A very cold-hardy plant, tolerating temperatures down to about -30°C[250]. A long-lived plant, specimens can survive in the garden for at least 50 years[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A very greedy plant inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1].

### 7.2.417 Geranium viscosissimum

Sticky Geranium, Sticky purple geranium

6 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 0.8 m hkuc

hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik-wis hpa7tmwatli xre7t hjonli

drutta Geranium viscosissimum is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Flowers LeavesEdible Uses: Flowers - added to salads or used as a garnish[172, 183]. Leaves - raw or cooked. Not choice[172].

tcanta None known

dwatta Astringent Salve StypticThe whole plant is astringent, salve and styptic[176]. An infusion of the leaves, plus a sweat bath with the leaves, is used as a treatment for colds[257]. It is used as a gargle in the treatment of sore throats[176]. An infusion of the leaves or the roots is used as a wash for sore eyes[257]. A poultice of the leaves or roots has been applied to cuts, sores etc[257].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any good soil in sun or partial shade[187]. Plants are hardy to about -25°C[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. This species is closely related to *G. nervosum*[200].

### 7.2.418 Polypodium glycyrrhiza

Licorice Fern

6 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 0.5 m hkuc

hmimhtut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprik-wis hpa7tmwatli hjonli

drutta Polypodium glycyrrhiza is a FERN growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. The seeds ripen from November to March. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: RootEdible Uses: Root - raw or cooked[257] The root is sweetly liquorice-flavoured but is

thin and fibrous and virtually inedible[200]. The root was commonly chewed for its very pleasant flavour by many native North American Indian tribes[256, 257]. It was often used as an appetiser, especially for children who would not eat[256]. Apart from its used as a pleasantly flavoured chew, it was seen as a famine food and was only used when there was a shortage of better foods[177, 257].

tcanta None known

dwatta Alterative Carminative Haemostatic PectoralLiquorice fern was employed medicinally by several native North American Indian tribes who used it especially as a treatment for a variety of chest complaints[257]. It is little, if at all, used in modern herbalism. The rhizomes are alterative, carminative, haemostatic and pectoral[257]. The raw rhizomes have been eaten, or an infusion has been used, in the treatment of coughs and colds, chest pains, shortness of breath and VD[257]. The roots have been chewed, and the juice swallowed, as a treatment for sore throats and the spitting or vomiting of blood[257]. A tea of the pounded boiled rhizomes, mixed with fir needles, has been used to treat measles[213]. Coughs have been treated by chewing and slowly swallowing the juice of the roasted rhizome[213]. The roots have been used in the treatment of colds and sore throats[256].

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division in spring[200].

nwatta Tolerates short periods of drought and direct sunlight, but it prefers bright filtered light[200]. Plants can be grown on a drystone wall[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. There are several named varieties selected for their ornamental value[200]. Polypodium glycyrrhiza hybridizes with *P. calirhiza* and with *P. hesperium* to produce sterile triploids with misshapen spores[270]. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a clumper with limited spread [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.419 *Carthamus lanatus*

Distaff Thistle

6 tlin 10 cyuc 1 kcaak 1 tcan 1 dwat 0.6 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjlut hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

drutta *Carthamus lanatus* is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta An edible oil is obtained from the seed[105, 183].

tcanta An oil is obtained from the seed[240], though the report gives no more details[K].

dwatta The plant is anthelmintic, diaphoretic and febrifuge[240].

propta Seed - sow spring in gentle heat in a greenhouse. Germination usually takes place within 2 - 4 weeks at 15°C[138]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in situ in April/May[138] but plants may not then mature their seed.

nwatta Succeeds in ordinary garden soil[1]. Requires a position in full sun[138]. This species is a potentially serious pest plant in N. America[274].

## 7.2.420 *Corydalis incisa*

Incised fumewort

6 tlin 10 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc

hmim cyutli tcup hwicli hrasjlut hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

drutta *Corydalis incisa* is a ANNUAL/BIENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Young plant - cooked in spring[177, 178, 179]. Slightly deleterious[178].

tcanta MiscellanyNone known

dwatta MiscellanyThe dried and powdered flowers are used in the treatment of rectal collapse[218]. An aqueous decoction of the plant is used in the treatment of abscesses[218]. Used in China and Japan in folk medicine to treat inflammation, headaches, skin diseases, and other ailments [1-7].

propta Seed - best sown as soon as it is ripe, the seed rapidly loses viability if it is allowed to become dry[129]. Surface sow and keep moist, it usually germinates in 1 - 3 months at 15°C[164]. Germinates in spring according to another report[129]. Two months warm, then a cold stratification improves the germination of stored seed[134, 164]. Seedlings only produce one leaf in their first year of growth[175] and are very prone to damping off[129]. This species is a biennial and probably germinates more easily than the perennial species.

nwatta Can be invasive outside its natural range. *Corydalis incisa* is an annual or biennial, spring-ephemeral herb. Seeds germinate in the spring and develop small rosettes, which wither during the summer. They emerge again as rosettes throughout the winter and produce compact flowering racemes the following spring [1-7]. In its native range in Asia, *C. incisa* occurs along stream valleys, irrigation channels, and forest margins; in wastelands, roadsides, and forestlands; and on rock walls. In the United States, it grows in mesic and alluvial forest habitats. Under horticultural conditions, *C. incisa* prefers cooler exposures [1-7]. The known distribution globally has Plant Hardiness Zones 6-10, areas with 20-100+ inches of annual precipitation, and the following Köppen-Geiger climate classes: humid subtropical, marine west coast, humid continental with warm summers, and humid continental with cool summers. There is no evidence that *C. incisa* occurs in Mediterranean climates. It is potentially suitable because the plants usually are dormant during the summer when conditions are driest in Mediterranean climates [1-7]. The following notes are based on the general needs of the genus. Prefers a moist, well-drained rather light soil, thriving in semi-shade[1]. Grows well in a woodland garden or peat bed. Plants seem to be immune to the predations of rabbits[233].

## 7.2.421 *Meconopsis aculeata*

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta *Meconopsis aculeata* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: The plant is said to be edible[145] but no further details are known, not even which part of the plant can be eaten.

tcanta None known

dwatta Analgesic Febrifuge NarcoticThe root contains narcotic principles[211, 240]. The entire plant is used in Tibetan medicine, where it is considered to have a bitter taste and a cooling potency[241]. Analgesic and febrifuge, it is used to help heal broken bones, to treat inflammation from fractures and pain in the upper bodily region, especially around the ribs[241].

propta Seed - best sown in a cold frame as soon as it is ripe in late summer. Spring sown seed is slower to germinate[200]. When they are large enough to handle, prick the

seedlings out into individual pots and plant them out in the summer.

nwatta Grows best in a woodland soil in partial shade[1, 200]. The soil should be lime-free, moist, well-drained and moderately rich[200]. Dislikes full sun and windy positions[200]. Monocarpic, the plants living for a number of years before flowering but then dying once they flower[200].

### 7.2.422 *Mimulus moschatus*

Musk Monkey Flower, Muskflower

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc  
hmimhtut cyutli tcuphja7n hwicli hrasjlutnyikfrp hpa7tli flat-prikklwis hpa7tmwatli hjonli

drutta *Mimulus moschatus* is a PERENNIAL growing to 0.3 m (1ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcaakta Young plant - boiled and used for food[257].

tcanta None known

dwatta None known

propta Seed - sow spring in a greenhouse and only lightly cover the seed[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed it can also be sown in situ in late spring after the last expected frosts[200]. Division in spring[200]. Very easy, large divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Cuttings of softwood, 5cm long in spring or summer[200].

nwatta Prefers rather moist places such as damp borders, margins of streams and boggy spots[1, 111]. Grows well in heavy clay soils. Thrives in full sun so long as the soil does not dry out[200], otherwise it is best grown in partial shade[187]. Grows well in shallow water, but it can be invasive[200]. Hardy to at least -15°C[200]. There are some named varieties, selected for their ornamental value[200]. All parts of the plant have a musky scent, though the form naturalized in Britain, and most cultivars, appear to be scentless[17, 200].

### 7.2.423 *Sedum album*

Small Houseleek, White stonecrop, Sedum, Stonecrop

6 tlin 8 cyuc 1 kcaak 3 tcan 1 dwat 0.1 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasjlutnyik hpa7tli flat-prikklwis hpa7tmwatli fyifxre7t hjonli

drutta *Sedum album* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf all year, in flower from July to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcaakta Edible Parts: Leaves Edible Uses: Leaves - raw or cooked[2, 46, 52, 100]. Usually eaten as a pickle[4], though it can also be added to salads or cooked with other leafy vegetables[244].

tcanta Agroforestry Uses: The plant spreads aggressively and can be used for ground cover in a sunny position amongst plants tall enough not to be overrun by it. It is best planted about 45cm apart each way[208]. Strong growing bulbs such as some lilies will grow happily through this ground cover[K]. The plant can grow in very low moisture levels and has been used as a green covering on roofs[372]. Green roofs are incorporated into the structure of the building, providing habitats for wildlife as well as insulating the

building and helping to improve the environment. The subspecies *minima* and the cultivars 'Athorum' and 'Coral Carpet' have been specifically mentioned in this respect.

dwatta Antinflammatory Poultice The leaves and stems are applied externally as a poultice to inflammations and are especially recommended for treating painful haemorrhoids[4, 244].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses: Alpine garden, Border, Container, Ground cover, Rock garden, Specimen. A very easily grown plant, it succeeds in most soils[188] but prefers a fertile well-drained soil[200]. Established plants are drought tolerant[190, 200], they grow well in dry soils and succeed on a wall[190]. Requires a sunny position[188]. Plants spread rapidly and aggressively at the roots[190]. If clearing the plant from an area it is quite important to try and remove every part of the plant since even a leaf or a small part of the stem, if left on the ground, can form roots and develop into a new plant[200]. This species has white flowers. All members of this genus are said to have edible leaves, though those species that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, Not North American native, Invasive. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2].

### 7.2.424 *Farfugium japonicum*

Leopard Plant

6 tlin 10 cyuc 1 kcaak 0 tcan 1 dwat 0.8 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-prikklwis hpa7tmwatli xre7t hjonli

drutta *Farfugium japonicum* is an evergreen Perennial growing to 0.8 m (2ft 7in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 8. It is in leaf all year, in flower from November to December. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Stem Edible Uses: Leaf stems - cooked[46, 61, 177]. The leaf stems are boiled in water to remove a bitter taste, the outer peel is removed and they are then added to salads, soups etc[183].

tcanta None known

dwatta Antidote Poultice The leaves are antidote[218]. They are taken internally to treat fish poisoning and externally to treat lacquer poisoning[218]. They are also applied to suppurating abscesses and pox[218].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Landscape Uses: Border, Foundation, Massing, Specimen, Woodland garden. Prefers a deep moist fertile humus-rich soil[200]. Requires a sheltered position[166]. Plants often wilt on bright sunny days if they are growing in a sunny position[200]. This species is not very hardy, tolerating temperatures down to between -5 to -10°C[200] and

succeeding outdoors in a woodland garden in the milder areas of Britain[166]. A good plant for growing in a window[1]. There is possibly some confusion, in the references quoted, between this species and *Ligularia japonica*[K]. Special Features: Attractive foliage, Attracts butterflies.

### 7.2.425 *Anemone rivularis*

Cao Yu Mei  
6 tlin 9 cyuc 1 kcak 0 tcan 2 dwat 0.6 m hkuc  
pcimhmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprikwis hpa7tmwatli fyfxre7t hjonli

drutta *Anemone rivularis* is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seeds - roasted and pickled[272].

tcanta None known

dwatta Analgesic Antidote Antiemetic VermifugeThe plant is said to be antiemetic and vermifuge[91]. It is said to warm the stomach and stop vomiting. A paste made from the plant is used in Nepal to treat coughs and fevers[272]. The juice of the leaf, mixed with water, is inhaled through each nostril to treat sinusitis[272]. The seeds are used in Tibetan medicine, they are said to have a bitter and acrid taste with a heating potency[241]. Analgesic and antidote, they are used in the treatment of rotting tissues, snake poisoning and stomach/intestinal pain from worm infestation[241]. A decoction of the root is applied externally to cuts and wounds[272].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as possible in late winter or early spring, it requires 3 - 5 weeks cold stratification. The seed usually germinates in 1 - 6 months at 20°C[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first year in a lightly shaded place in a greenhouse. When large enough, plant them out into their permanent positions in the spring. Division in late summer after the plant dies down.

nwatta Easily grown in a moist well-drained soil in sun or semi-shade[187]. Succeeds in ordinary garden soil but prefers a rich sandy loam[1]. Requires a damp soil, doing well by water[1, 111]. A very ornamental plant[1], it is hardy to about -20°C[187]. This species is closely related to *A. narcissiflora*[233]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 7.2.426 *Coprosma pumila*

6 tlin 9 cyuc 1 kcak 0 tcan 0 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta *Coprosma pumila* is an evergreen Shrub growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: CoffeeFruit - raw or cooked. Sweet, but with little flavour[225]. The orange-red fleshy fruit is about 7mm in diameter, though forms with fruits up to 13mm have been seen[225]. The roasted seed is an excellent coffee substitute[153].

tcanta DyeA yellow dye is obtained from the wood, it does not require a mordant[153].

dwatta None known

propta Seed - probably best sown as soon as it is ripe in a greenhouse or cold frame[K]. Sow stored seed in spring

in a cold frame[200]. Germination can be slow, often taking more than 12 months even when fresh seed is used[K]. When the seedlings are large enough to handle, prick them out into individual pots. Grow on the plants for at least their first winter in a greenhouse and plant out in late spring or early summer. Give the plants some protection from the cold for their first winter outdoors[K]. Cuttings of mature wood of the current year's growth, autumn in a frame.

nwatta Requires a moist, very well-drained neutral to slightly acid soil in full sun or light shade[200]. Prefers a permanent moist and peaty soil, but it is not an easy plant to grow in Britain[225]. Somewhat intolerant of frost, this species is only likely to succeed outdoors in the milder areas of Britain[200]. Another report says that it is fully hardy in Britain[225]. Closely related to *C. atropurpurea* and often confused with that species[225]. It is a very variable plant, hybridizing freely with other members of this genus[200, 225]. Plants are normally dioecious, though in some species the plants produce a few flowers of the opposite sex before the main flowering and a few hermaphrodite flowers are sometimes produced[225]. Male and female plants must usually be grown if seed is required. There is some confusion over the correct name of this species, it could be a part of *C. petriei*[200].

### 7.2.427 *Aletris farinosa*

Unicorn Root - Colic Root, White colicroot  
6 tlin 9 cyuc 1 kcak 0 tcan 3 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Aletris farinosa* is a PERENNIAL growing to 0.6 m (2ft) by 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: RootEdible Uses: Bulb - cooked[105, 161, 177]. Intensely bitter[2]. A bitter-sweet soapy taste[238].

tcanta None known

dwatta Antiflatulent Antiinflammatory Appetite Stimulants Appetizer Bitter Diuretic Dysentery Narcotic TonicThe greatest value of unicorn root is its tonic influence on the female generative organs, proving to be of great use in treating cases of habitual miscarriages[4]. Used for gynaecological disorders or 'female complaints' in the US including dysmenorrhoea, amenorrhoea and prolapsed vagina complaints [301]. It also promotes the appetite and is used in the treatment of diarrhoea, rheumatism and jaundice[222]. The root is bitter, diuretic, narcotic and tonic[1, 21, 46, 213]. Only use the dried rootstock[21], in large doses the fresh root is somewhat narcotic, emetic and cathartic[4]. A decoction of the root is a bitter tonic and has been used for expelling flatulence and for various uterine disorders[207, 222]. It is used in the treatment of colic, though small doses, especially of the fresh root[4], can cause hypogastric colic[222]. The root is harvested in late summer after flowering and dried for later use[238]. The root contains diosgenin, which has both anti-inflammatory and oestrogenic properties[222]. A tea of the leaves has been used in the treatment of colic, stomach disorders, dysentery and bloody dysentery[213, 257].

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse in early spring. Sow the seed thinly to allow the seedlings to be grown on for their first year without potting them up, but give a liquid feed from time to time to ensure that they do not become nutrient deficient. Prick the young plants out into individual pots the following spring and grow them on in the greenhouse for the next winter. Plant them out into their permanent positions in early summer. Division in spring.

nwatta Prefers a damp sunny position in peat, leafmold and sand[1]. Requires a sunny position[200]. Plants are hardy to between -10 and -15°C[200].

### 7.2.428 *Lysimachia fortunei*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.5 m hkuc  
hmimhtut cyutli tcuphja7nhs6s hwicli hrasjlutnyikfrip  
hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta *Lysimachia fortunei* is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta Edible Parts: Leaves Edible Uses: Condiment The young plant is edible[177, 179]. No more details are given. The leaves are also used as a condiment[46, 61, 177].

tcanta None known  
dwatta None known

propta Seed - sow autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, succeeding in a moist loamy soil[1]. Judging by its native habitat, it should succeed in shallow water. Grows well in heavy clay soils. Most species in this genus seem to be immune to the predations of rabbits[233].

### 7.2.429 *Artemisia maritima*

Sea Wormwood  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat m hkuc  
htut cyutli hgatkuyctcup hwicli hyishrasjlut hpa7tli flatprikliwshsom hpa7tmwatli xre7t hjonli

drutta *Artemisia maritima* is a deciduous Shrub growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta Edible Parts: Edible Uses: Condiment The leaves are occasionally used as a flavouring[183]. Some caution is advised, see the notes above on toxicity.

tcanta Repellent Strewing The growing shoots are said to repel insects and mice[6, 18, 20], they have also been used as a strewing herb[4, 14]. An infusion is said to discourage slugs and insects[14, 18].

dwatta Anthelmintic Antiseptic Antispasmodic Carminative Cholagogue Emmenagogue Febrifuge Stimulant Stomachic Tonic Vermifuge Sea wormwood is not much used in herbal medicine, though it is often used domestically. Its medicinal virtues are similar to wormwood, *A. absinthum*, though milder in their action. It is used mainly as a tonic to the digestive system, in treating intermittent fevers and as a vermifuge[4]. The leaves and flowering shoots are anthelmintic, antiseptic, antispasmodic, carminative, cholagogue, emmenagogue, febrifuge, stimulant, stomachic, tonic and vermifuge[4, 145]. The plant is harvested as it comes into flower and is dried for later use[4]. The unexpanded floral heads contain the vermicide 'santonin'[218].

propta Seed - surface sow from late winter to early summer in a greenhouse, making sure that the compost does not dry out[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer. Cuttings of half-ripe wood, July/August in a frame. Division in spring or autumn[200].

nwatta Succeeds in any soil but prefers a poor dry soil with a warm aspect[37]. Easily grown in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Plants are longer lived, more hardy and

more aromatic when they are grown in a poor dry soil[245]. Tolerates a pH in the range 6.0 to 7.6. Dislikes shade. Established plants are very drought tolerant[190, 200]. Tolerates maritime exposure[190]. The whole plant has a sweet aromatic smell[245]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.430 *Carduus crispus*

Wetted Thistle, Curly plumeless thistle  
6 tlin 9 cyuc 1 kcaak 1 tcan 1 dwat 0.9 m hkuc  
htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Carduus crispus* is a BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Oil Edible Uses: Oil Young leaves - cooked[105]. An emergency food, used when all else fails[177].

tcanta Oil The seed of all species of thistles yields a good oil by expression[4]. No details of potential yields etc are given[K]. A favorite foodplant of caterpillars of the Painted Lady butterfly (*Vanessa cardui*).

dwatta Alterative Anodyne The root is alterative and anodyne[178, 218].

propta Seed - sow spring in situ.

nwatta Succeeds in a sunny position in ordinary garden soil[1, 200]. This species is closely related to *C. acanthoides*[17].

### 7.2.431 *Scabiosa japonica*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwslip hpa7tmwatli xre7t hjonli

drutta *Scabiosa japonica* is a BIENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: Leaves Root Edible Uses: Leaves - cooked. Eaten boiled[105, 177]. Root[105, 177, 179]. No more details are given.

tcanta None known  
dwatta None known

propta Seed - sow spring in a cold frame. The seedlings are subject to damping off[1] so water with care and make sure to give adequate ventilation. Prick out the seedlings into individual pots once they are large enough to handle and plant them out into their permanent positions in the summer.

nwatta Prefers a neutral or alkaline soil and a sunny position[200]. Succeeds in ordinary garden soil[1]. Requires a well-drained soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

### 7.2.432 *Conradina verticillata*

Cumberland Rosemary  
6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hras hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta *Conradina verticillata* is a deciduous Shrub growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic

(mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

**kcakta** Edible Parts: Edible Uses: CondimentThe leaves have a strong pleasant scent, reminiscent of rosemary, and are used as a rosemary substitute as a flavouring in cooking[183].

**tcanta** None known

**dwatta** None known

**propta** Seed - sow spring in a greenhouse[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out in late spring or early summer, after the last expected frosts. Cuttings of new shoots in spring in a frame[200].

**nwatta** Requires a light soil and a very sunny position[200]. This species is not hardy in the colder areas of the country, it tolerates temperatures down to between -5 and -10°C[200]. This is an endangered species in the wild[183].

### 7.2.433 *Ranunculus californicus*

California Buttercup

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltutnyik hpa7tli flatprikwis  
hpa7tmwatli xre7t hjonli

**drutta** *Ranunculus californicus* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

**kcakta** Edible Parts: SeedEdible Uses: Seed - cooked[257]. It is usually ground into a powder and can then be used as a mush with water, a flavouring in soups, or mixed with cereals when making bread etc[105, 161, 257].

**tcanta** None known

**dwatta** None known

**propta** Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

**nwatta** Prefers a moist loamy soil[1]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

### 7.2.434 *Coprosma atropurpurea*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjltut hpa7tli flatprik  
hpa7tmwatli nyanhjen hjonli

**drutta** *Coprosma atropurpurea* is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

**kcakta** Edible Parts: FruitEdible Uses: CoffeeFruit - raw[173]. Sweet, but with little flavour[225, K]. The wine-red fruit is about 8 - 12mm in diameter[200, 225]. The roasted seed is an excellent coffee substitute[153].

**tcanta** DyeA yellow dye is obtained from the wood, it does not require a mordant[153].

**dwatta** None known

**propta** Seed - probably best sown as soon as it is ripe in a greenhouse or cold frame[K]. Sow stored seed in spring in a cold frame[200]. Germination can be slow, often taking more than 12 months even when fresh seed is used[K]. When the seedlings are large enough to handle, prick them out into individual pots. Grow on the plants for at least their

first winter in a greenhouse and plant out in late spring or early summer. Give the plants some protection from the cold for their first winter outdoors[K]. Cuttings of mature wood of the current year's growth, autumn in a frame. Division of suckers[225].

**nwatta** Requires a moist, very well-drained neutral to slightly acid soil in full sun or light shade[200]. Succeeds in most soils, so long as they are well-drained[225]. Somewhat intolerant of frost, this species is only likely to succeed outdoors in the milder areas of Britain[200]. Another report says that it is quite hardy in Britain[225]. Closely related to *C. pumila*, and often confused with that species[225]. It hybridizes freely with other members of this genus[200, 225]. This species is often confused with *C. petriei*[11, 44], though it is quite distinct and does not hybridise with that species[225]. Plants are normally dioecious, though in some species the plants produce a few flowers of the opposite sex before the main flowering and a few hermaphrodite flowers are sometimes produced[225]. Male and female plants must usually be grown if seed is required.

### 7.2.435 *Xanthium strumarium*

Cocklebur, Rough cocklebur, Canada cocklebur

6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.8 m hkuc  
htut cyutli kyuctcup hwicli hyishrasjltutnyik hpa7tli flatprik-  
wis hpa7tmwatli fyif hjonli

**drutta** *Xanthium strumarium* is a ANNUAL growing to 0.8 m (2ft 7in) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to October, and the seeds ripen from August to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

**kcakta** Edible Parts: Leaves SeedEdible Uses: Leaves and young plants - cooked[2, 105, 177]. They must be thoroughly boiled and then washed[179]. Caution is advised, the plant is probably poisonous[218]. Seed - raw or cooked[212]. It can be used as a piñole[257]. The seed can be ground into a powder and mixed with flour for making bread, cakes etc[105, 257]. The seed contains about 36.7% protein, 38.6% fat, 5.2% ash[179]. It also contains a glycoside[179] and is probably poisonous.

**tcanta** Dye Essential Repellent TanninThe dried leaves are a source of tannin[145]. A yellow dye is obtained from the leaves[178]. The seed powder has been used as a blue body paint[257]. The dried plant repels weevils from stored wheat grain[178]. The seed contains an essential oil[272].

**dwatta** Anodyne Antibacterial Antifungal Antiperiodic Antirheumatic Antispasmodic Antitussive Appetizer Cytotoxic Diaphoretic Diuretic Emollient Febrifuge Hypoglycaemic Laxative Leprosy Malaria Sedative StomachicThe leaves and root are anodyne, antirheumatic, appetizer, diaphoretic, diuretic, emollient, laxative and sedative[61, 147, 178, 222]. The plant is considered to be useful in treating long-standing cases of malaria[240] and is used as an adulterant for *Datura stramonium*[61]. An infusion of the plant has been used in the treatment of rheumatism, diseased kidneys and tuberculosis[257]. It has also been used as a liniment on the armpits to reduce perspiration[257]. The fruits contain a number of medically active compounds including glycosides and phytosterols[279]. They are anodyne, antibacterial, antifungal, antimalarial, antirheumatic, antispasmodic, antitussive, cytotoxic, hypoglycaemic and stomachic[238, 279]. They are used internally in the treatment of allergic rhinitis, sinusitis, catarrh, rheumatism, rheumatoid arthritis, constipation, diarrhoea, lumbago, leprosy and pruritis[238, 257]. They are also used externally to treat pruritis[238]. The fruits are harvested when ripe and dried for later use[238]. The root is a bitter tonic and febrifuge[240]. It has historically been used in the treatment of scrofulous tumours[222]. A decoction of the root has been used in the treatment of high fevers and to help a woman expel the afterbirth[257]. A decoction of the seeds has been used in the treatment of bladder complaints[257]. A poultice of the powdered seed has been applied as a salve on open sores[257].



propta Seed - sow spring or autumn in situ[238]. The seed requires plenty of moisture in order to germinate.

nwatta Requires a sunny position, succeeding in most soils. Prefers a poor dry soil[238]. Hardy to about -15°C[238]. Plants often self sow and in some parts of the world have become noxious weeds[238].

### 7.2.436 *Grindelia robusta*

Great Valley Gumweed

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli hgatkyuctcup hwicli hyishrasjlut hpa7tli flatprikli-wishsom hpa7tmwatli xre7t hjonli

drutta *Grindelia robusta* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in saline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Edible Uses: Leaves - raw[257].

tcanta Dye Hair Parasiticide Yellow and green dyes are obtained from the flowering heads and pods[168]. Aromatic. A decoction of the roots has been used as a hair shampoo to kill lice[257].

dwatta Antispasmodic Blood purifier Demulcent Expecto- rant Parasiticide Sedative Stomachic The leaves and flowering tops are antiphlogistic, antispasmodic, balsamic, demulcent, expectorant, sedative, stomachic and a vascular tonic[4, 7, 21, 46, 61, 207, 213]. Blood purifier[4]. The plant is applied externally as a compress on inflamed or irritated areas of the skin[7, 257]. Used internally, it slows down the heartbeat and reduces the stimulation of the nerve endings in the air passages that causes coughing - it is therefore extremely effective as a calming agent in the treatment of asthma[7]. The fluid extract is prepared by placing the freshly gathered leaves and flowers in a small quantity of simmering water for about 15 minutes[213]. The plant is used to treat people affected by poison-ivy[213].

propta Seed - sow autumn or spring in a cool greenhouse and only just cover the seed. Prick out the plants into individual pots when they are large enough to handle and plant them out into their permanent positions in early summer.

nwatta Succeeds in any well-drained soil in full sun[200]. Does well on dry sandy banks and in poor soils[200]. Plants tend to concentrate selenium in the leaves and stems, this is especially noticeable on soils that are relatively rich in that element[21]. Some authorities class this species as a synonym of *G. camporum*.

### 7.2.437 *Sedum lineare*

Needle stonecrop

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli hgatkyuctcup hwicli hrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta *Sedum lineare* is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Edible Uses: Leaves - raw or cooked[179]. Some caution is advised[218].

tcanta None known

dwatta Poultice The fresh plant is crushed and applied externally to burns and scalds[218].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter

and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. Succeeds on a wall[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

### 7.2.438 *Swertia bimaculata*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.6 m hkuc  
hmmihtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta *Swertia bimaculata* is a ANNUAL/BIENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Root Edible Uses: Root - cooked[105, 177, 179].

tcanta None known

dwatta None known

propta Seed - sow spring in a cold frame at 10°C or less[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta We have no details for this species but suggest growing it in a moist well-drained soil in a sunny position.

### 7.2.439 *Salvia moorcroftiana*

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc  
htut cyutli kyuctcup hwicli hrasjlut hpa7tli flatprikli-wis hpa7tmwatli xre7t hjonli

drutta *Salvia moorcroftiana* is a PERENNIAL growing to 0.9 m (3ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Stem Edible Uses: Stems - peeled[105, 177]. They are occasionally eaten[183].

tcanta None known

dwatta Astringent Dysentery Emetic Poultice The roots are used in the treatment of colds and coughs[240]. The seed is emetic[240]. It is used in the treatment of dysentery, haemorrhoids, colic and, externally, boils[240]. A poultice of the leaves is used as a dressing for wounds and is also applied to itchy skin[240].

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Plants can be killed by excessive winter wet[200]. Closely related to *S. argentea*[1]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.440 *Geranium thunbergii*

Thunberg's geranium

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Geranium thunbergii* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: TeaYoung leaves[183]. No further details are given. Old leaves, when the plant is at the peak of its growth, are used as a tea substitute[183].

tcanta None known

dwatta AstringentThe whole plant is astringent[105].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 7.2.441 *Dracocephalum moldavica*

Moldavian Balm, Moldavian dragonhead

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Dracocephalum moldavica* is an ANNUAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: TeaThe lemon-scented leaves are used to make a tea[183]. Young shoots[183]. No further details are given.

tcanta EssentialThe plant contains an essential oil, this is a possible source of citral[240].

dwatta Astringent Carminative Tonic VulneraryThe seeds are astringent, carminative and tonic[240]. They are used as a demulcent in the treatment of fevers[240]. The plant is astringent, tonic and vulnerary[240].

propta Seed - sow early spring in situ. Pinch back the shoot tips in May in order to encourage bushy growth[200].

nwatta Succeeds in a sunny position in a fertile well-drained soil[200]. The plant is sometimes cultivated for its essential oil[266]. The plant is very fragrant[200], with both the leaves and the flowers emitting a most refreshing scent of lemons[245]. The flowers remain fragrant and fresh for several weeks[245]. It is a useful plant for filling gaps in the summer border[200].

## 7.2.442 *Pachyphragma macrophylla*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

pcimhmim cyutli hgatkyuctcup hwicli hrasljutnyikfrip hpa7tli flatprikklwis hpa7tmwatli xre7t hjonli

drutta *Pachyphragma macrophylla* is an evergreen Perennial growing to 0.3 m (1ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from March to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcaakta Edible Parts: LeavesEdible Uses: It would be worthwhile trying out the leaves of this species for edibility. They are almost certainly not poisonous[K].

tcanta An excellent weed-smothering ground cover plant for shady areas[200]. The plants have persistent basal rosettes but only achieve full ground cover from mid or late spring until early winter each year[200].

dwatta None known

propta Seed - sow autumn in a greenhouse[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring[200]. Very easy, larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer. Basal cuttings in late spring[200]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Requires a leafy soil and a damp shady position[187, 200]. Another report says that it succeeds in dry soils and, once established, tolerates drought[190]. Succeeds in heavy clays[200]. Very shade tolerant[200]. Succeeds in full sun or partial shade[188]. Possibly hardy to about -15°C[187, 200]. Plants have persistent basal rosettes[200].

## 7.2.443 *Salvia carnosia*

Purple Sage

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.8 m hkuc

htut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikklwis  
hpa7tmwatli xre7t hjonli

drutta *Salvia carnosia* is an evergreen Shrub growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: SeedEdible Uses: Seed - cooked. Ground into a powder and used to thicken soups etc or added to cereal flours when making bread etc[105].

tcanta None known

dwatta Analgesic Antispasmodic Febrifuge Pectoral StomachicA decoction of the seeds and stems is used to treat colds[61]. A decoction or infusion of the leaves has been used in the treatment of fevers, coughs, colds and stomach aches[257]. A poultice of the crushed leaves has been applied to the chest to treat congestion[257]. A decoction of the leaves and stems can be drunk, used as a wash or as a steam bath in the treatment of headaches[257]. A decoction of the flowering stems has been used as a poultice and a wash to treat swollen leg veins[257]. The plant is much valued as a treatment for an epileptic or faint person, either administered as a drink or prepared like tobacco and the smoke blown into the patients face[216, 257].

propta Seed - sow March/April in a greenhouse[200]. Germination usually takes place within 2 weeks. Prick out the seedlings into individual pots when they are large enough to handle and plant them out in early summer. In areas where the plant is towards the limits of its hardiness, it is best to grow the plants on in a greenhouse for their first winter and plant them out in late spring of the following year. Cuttings of half-ripe wood succeed at almost any time in the growing season[200].

nwatta Requires a very well-drained light sandy soil in a sunny position[200]. Prefers a rich soil[1]. Soils rich in nitrogen encourage excessive leaf growth at the expense of flowering[11]. Plants can be killed by excessive winter wet[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.444 *Gunnera magellanica*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat m hkuc

hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikklwis

soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Alternative Antiscrophulatic Astringent Cancer TonicThe dried leaves are alterative, antiscrofulatic, astringent and tonic[4, 21, 46, 207]. A tea made from the leaves is used in the treatment of kidney ailments and sore throats[222, 257]. A strong leaf tea has been used in the treatment of scrofula[222]. It is applied externally to skin diseases and eye infections[222]. It is said that an oil helpful in

the treatment of cancer has been obtained from the plant[4]. Some caution is advised since an overdose can cause nausea and vomiting[4].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 6 - 8cm with a heel, late summer in a sandy soil in a frame[200].

nwatta Requires a light well-drained soil in a sunny open position[200]. Tolerates a pH range from 5.5 to 8[200].

hpa7tmwatli nyanhjen hjonli

drutta Gunnera magellanica is a PERENNIAL. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: One report says that the fruit might be edible[177]. The fruit is about 5mm in diameter[200].

tcanta A carpeting plant that roots as it spreads, it is suitable for ground cover when spaced about 45cm apart each way[208].

dwatta None known

propta Seed - best sown as soon as soon as it is ripe in the autumn in a sandy mix in a cold frame[200]. The seed can also be sown in the spring[188]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division as new growth commences in the spring[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Requires a damp humus rich soil in a sunny position or semi-shade[1, 200]. Prefers a cool moist position[208]. Plants are hardy to at least -10°C[187]. The plant has a creeping root and spreads to form extensive patches[187]. The top part of the inflorescence is male, the bottom is female and the middle is hermaphrodite according to one report whilst another says that the flowers are unisexual without saying if the two sexes are on the same plant[200]. Male and female flowers are on separate plants[188]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.445 *Potentilla glandulosa*

Gland Cinquefoil, Sticky cinquefoil, Arizona cinquefoil, Ashland cinquefoil, Ewan's cinquefoil, Hans

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli fyixre7t hjonli

drutta *Potentilla glandulosa* is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Edible Uses: TeaA tea-like beverage is made by boiling the leaves or the whole plant in water[61, 11, 177, 183].

tcanta None known

dwatta Astringent Stimulant TonicAll parts of the plant are astringent[257]. An infusion has been drunk, and a poultice of the plant applied externally in the treatment of swollen parts[257]. An infusion of the plant has been used as a stimulant and tonic[257].

propta Seed - sow early spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found that it is better to pot up the smaller divisions and grow them on in light shade in a cold frame until they are well established before planting them out in late spring or early summer.

nwatta Easily grown in a well-drained loam, preferring a position in full sun but tolerating shade[1]. Prefers an al-

kaline soil but tolerates a slightly acid soil[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.446 *Buglossoides arvensis*

Field Gromwell, Corn gromwell

6 tlin 10 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Buglossoides arvensis* is an ANNUAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta The European Union has granted the refined oil of the seed of *Buglossoides arvensis* novel food status (a type of food that does not have a significant history of consumption or is produced by a method that has not previously been used for food) and some farmers are growing it.

tcanta None known

dwatta DiureticAn infusion of the leaves is used as a diuretic[240].

propta Seed - sow spring in situ. Germination should take place within a few weeks.

nwatta 207189 Prefers a moderately fertile well-drained soil[200].

## 7.2.447 *Echinops spinosissimus*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.8 m hkuc htut cyutli hgatyuctcup hwicli hyishrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Echinops spinosissimus* is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Edible Uses: GumYields a gum that is used for chewing[46, 61, 177].

tcanta GumNone known

dwatta None known

propta Seed - sow early spring in a cold frame[111]. The seed usually germinates in 3 - 9 weeks at 25°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in an outdoor seedbed in mid spring and is then planted out into its permanent position in late summer or the autumn[111]. Division in autumn[111]. Root cuttings in the winter[200].

nwatta Succeeds in a sunny position in any well drained soil of low or medium fertility[175, 200]. Established plants are drought tolerant[190].

## 7.2.448 *Saxifraga fortunei*

Saxifrage

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc hmim cyutli tcup hwicli hrasljutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Saxifraga fortunei* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[105]. They are added to soups or cooked with rice[177].

tcanta None known  
dwatta None known  
propta Seed - we have no information for this species but suggest sowing the seed in a cold frame in the spring. Surface sow, or only just cover the seed, and make sure that the compost does not dry out. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in the greenhouse or cold frame for their first winter. Plant them out in late spring after the last expected frosts. Division in spring. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses:Alpine garden, Container, Ground cover, Massing, Rock garden, Woodland garden. Prefers a cool position in a moist humus-rich soil[1]. Prefers an acid soil[200]. Grows well in light woodland[200] or in a shady position in a rock garden. The plant is hardy to at least -15°C[187], the leaves and the flowers, however, are liable to be damaged by autumn frosts[200]. A polymorphic species[58], there are several named forms selected for their ornamental value[187]. Special Features:Attractive foliage, Naturalizing.

## 7.2.449 Sedum sarmentosum

stringy stoncrop  
6 tlin 9 cyuc 1 ckak 0 tcan 1 dwat 0.1 m hkuc  
htut cyutli ghtakuyctcup hwicli hrsajlutyrik hpa7tli flatprikliw hpa7tmwatli fyixre7t hjonli

drutta Sedum sarmentosum is an evergreen Perennial growing to 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

ckakta Edible Parts: LeavesEdible Uses: Young leaves and stems - raw or cooked[105, 177]. Used as a vegetable[266].

tcanta None known  
dwatta Used medicinally[266]. No further information is given[266].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

## 7.2.450 Inula britannica chinensis

Xuan Fu Hua  
6 tlin 9 cyuc 1 ckak 0 tcan 3 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrsajlutyrik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Inula britannica chinensis is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium

(loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

ckakta Edible Parts: LeavesEdible Uses: Leaves - cooked[179]. An emergency food, it is only used when better foods are not available[177].

tcanta None known  
dwatta Alterative Carminative Cholagogue Deobstruent Expectorant Laxative Nervine Stomachic Tonic VulneraryXuan Fu Hua is used in Chinese herbalism as a mildly warming expectorant remedy and it is especially suitable where phlegm has accumulated in the chest[254]. It has been used as an adulterant of arnica (*Arnica montana*) [4]. The flowers are more commonly used, but the leaves are also used, generally for less serious conditions[254]. The leaf is discutient and vulnerary[218]. The flowers are alterative, antibacterial, carminative, cholagogue, deobstruent, depurative, diuretic, expectorant, laxative, nervine, stomachic, tonic and vulnerary[147, 176, 178, 218, 279]. They are used internally in the treatment of bronchial complaints with profuse phlegm, nausea and vomiting, hiccups and flatulence[176, 238]. The flowers have an antibacterial action, but this can be destroyed by proteins in the body[176]. The plant is harvested when in flower and can be dried for later use[254]. The root is discutient, resolvent and vulnerary[218]. The plant has been mentioned as a possible treatment for cancer of the oesophagus[218].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it is worthwhile trying a sowing in situ in the spring or the autumn. Division in spring or autumn[111].

nwatta Succeeds in a sunny position in any moderately fertile well-drained soil[200]. Grows well in heavy clay soils. Plants are hardy to at least -15°C[238]. This sub-species is the form that is most used medicinally, it is cultivated as a medicinal plant in China[178].

## 7.2.451 Geranium dissectum

Cut-Leafed Cranesbill, Cutleaf geranium  
6 tlin 9 cyuc 1 ckak 0 tcan 2 dwat 0.6 m hkuc  
htut cyutli tcup hwicli hrsajlutyrik hpa7tli flatprikliw hpa7tmwatli fyixre7t hjonli

drutta Geranium dissectum is an ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

ckakta Edible Parts: RootEdible Uses: Root - cooked. A famine food, used when all else fails[177].

tcanta Dye TanninA brown dye is obtained from the dry flowers[168]. The leaves and roots are rich in tannin[4].

dwatta Antiseptic Astringent Cholera Dysentery Syptic TonicThe whole plant, but especially the roots, is rich in tannin[4]. It is antiseptic, highly astringent, syptic and tonic[4]. An infusion of the whole plant, or of the roots alone, is used in the treatment of diarrhoea (especially for children and the elderly), dysentery, cholera, gastro-enteritis, internal bleeding, excessive menstruation etc[4]. Externally, it is used in the treatment of prurulent wounds, haemorrhoids, thrush, vaginal discharges, inflammations of the mouth etc[238]. It is best to harvest the roots as the plant comes into flower since they are then at their most active medicinally[4]. The leaves should be harvested before the plant sets seed[4]. Both are dried for later use[238].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a range of soil types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

propta Seed - best sown as soon as it is ripe in a cold frame[133, 134]. Fresh seed germinates in 3 - 6 weeks[133]. Pre-soak stored seed for 24 hours in warm water, sow shallowly and keep in a shady position at 15°C[124]. Germination may be slow and erratic[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in the summer. Division in April/May. Very easy, the larger tubers can be planted out straight into their permanent positions whilst it is best to pot up the smaller ones and grow them on for a season before planting them out.

nwatta Landscape Uses:Border, Container, Rock garden. Prefers a cool habitat and a well-drained humus rich soil[13]. Easily grown in a stony leafy soil in sun or shade[90]. Thrives in the light shade of trees. Tolerates a pH between 5.5 and 8[200]. This species is hardy to about -18°C[200]. A very ornamental plant[1]. Plants seem to be immune to the predations of rabbits[233]. Special Features:Attractive foliage, Not North American native, Suitable for cut flowers.

## 7.2.555 Arnebia benthamii

6 tlin 9 cyuc 0 ckak 0 tcan 1 dwat 0.9 m hkuc  
htut cyutli kyuctup hwicli hyishraas hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Arnebia benthamii is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

ckakta None known  
tcanta MiscellanyNone known  
dwatta Cardiac Febrifuge MiscellanyCardiac and febrifuge. The plant is considered to be useful in the treatment of diseases of the tongue and throat[145, 240].

propta Seed - sow spring in a greenhouse. Germination usually takes place within 2 - 8 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant out in late spring or early summer, after the last expected frosts. It is best to harvest the seed when it is slightly under-ripe, since it is quickly dispersed when ripe[200]. Cuttings with a heel in the autumn in sand in a cold frame[1]. Root cuttings in sand in a frame during the winter[1].

nwatta Requires a well-drained gritty soil and a sunny position in the rock garden or on a dry wall[1]. 211075

## 7.2.556 Erysimum cheiri

Wallflower, Aegean wallflower  
6 tlin 9 cyuc 0 ckak 0 tcan 2 dwat 0.5 m hkuc  
htut cyutli kyuctup hwicli hyishrasjlutyrik hpa7tli priklwisslip hpa7tmwatli xre7t hjonli

drutta Erysimum cheiri is an evergreen Perennial growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

ckakta None known  
tcanta EssentialThe flowers contain 0.06% essential oil[240]. It has a pleasing aroma if diluted and is used in perfumery[46, 61, 114, 244]. The seed contains about 20% fixed oil[240], but no details of any uses are given[K].

dwatta Antirheumatic Antispasmodic Aphrodisiac Cardiotonic Diuretic Emmenagogue Expectorant Nervine Ophthalmic Purgative Resolvent Stomachic TonicWallflower was formerly used mainly as a diuretic and emmenagogue but recent research has shown that it is more valuable for its effect

on the heart[254]. In small doses it is a cardiotonic, supporting a failing heart in a similar manner to foxglove (*Digitalis purpurea*) [254]. In more than small doses, however, it is toxic and so is seldom used in herbal medicine[254]. The flowers and stems are antirheumatic, antispasmodic, cardiotonic, emmenagogue, nervine, purgative and resolvent[4, 7, 46, 61, 240]. They are used in the treatment of impotence and paralysis[240]. The essential oil is normally used[4]. This should be used with caution because large doses are toxic[7]. The plant contains the chemical compound cheiranthin which has a stronger cardiotonic action than digitalis (obtained from *Digitalis* species). If taken in large doses this is very poisonous and so this plant should not be used medicinally without expert supervision[244]. The seeds are aphrodisiac, diuretic, expectorant, stomachic and tonic[240]. They are used in the treatment of dry bronchitis, fevers and injuries to the eyes[240].

propta Seed - sow spring in an outdoor seedbed. Germination should take place within 3 weeks. Plant the seedlings into their permanent positions when they are large enough to handle. If seed is in short supply, it can be sown in spring in pots in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer.

nwatta Prefers a position in full sun in a circumneutral soil[1, 111, 200]. Succeeds in ordinary garden soils[1], tolerating hot and limey soils[187]. Plants are liable to die out if the soil is too rich[111]. Wallflowers are perennial, though they are usually grown as biennials in the flower garden for spring and early summer bedding[1]. There are some named varieties[187]. A very ornamental plant[7], it is liable to die out after flowering, probably because it exhausts itself by producing so many flowers. Plants require a very well-drained dry soil if they are to survive a second winter[187]. They grow well on dry stone walls[201] and also on old mortared walls where they usually self-sow[219]. A good butterfly and moth plant[17, 30]. A good companion for apple trees[18, 20, 201].

## 7.2.557 Phlox nivalis

Pine phlox, Trailing phlox  
6 tlin 9 cyuc 0 ckak 3 tcan 0 dwat 0.3 m hkuc  
hmimhtut cyutli ghtakuyctcup hwicli hrsajlut hpa7tli flatprik hpa7tmwatli hjonli

drutta Phlox nivalis is a PERENNIAL growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

ckakta None known  
tcanta A medium density groundcover that can be grown in semi-shade. Good for woodland gardening.

dwatta None known  
propta Division or by cuttings.

nwatta Low growing, evergreen, mound-forming shrub or semi-woody perennial. Prefers full sun to semi-shade, dry to moist well-drained soil. USDA Hardiness Zone: 4 to 9. It's natural distribution is on sandhills, dry pinelands, dry deciduous woods, open slopes and flats in sandy ground. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 7.2.558 Helianthemum canadense

Frostweed, Longbranch frostweed  
6 tlin 9 cyuc 0 ckak 0 tcan 2 dwat 0.4 m hkuc  
htut cyutli kyuctup hwicli hrsajlut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Helianthemum canadense is a PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, cleistogamy. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained

herbal use should only be undertaken under the supervision of a qualified practitioner. See also the notes above on toxicity. A fluid extract of the fresh leaves is irritant, narcotic, rubefacient and stimulant[4]. It has been used with some success in the treatment of paralysis, obstinate hepatic eruptions, palsy and in various forms of chronic and obstinate eruptive diseases[4]. A mash of the leaves has been used to treat ringworm[213]. An external application has also been used in the treatment of herpes sores[213]. A poultice of the plant has been used to treat infectious sores on the lips[257]. The root has been used to make a poultice and salve in the treatment of chronic sores and swollen glands[257]. A homeopathic remedy is made from the fresh leaves[232]. These should be harvested of a night-time, during damp weather and before the plant flowers[232]. This remedy has a wide range of applications and is one of the main treatments for mumps[232], it is also used in a wide range of skin disorders[4].

propta Seed - best sown in a cold frame as soon as it is ripe. Pre-soak the seed for 24 hours in hot water (starting at a temperature of 80 - 90c and allowing it to cool) prior to sowing in order to leach out any germination inhibitors[200]. The stored seed also needs hot water treatment and can be sown in early spring in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 10cm with a heel, July/August in a frame[200]. Root cuttings 4cm long taken in December and potted up vertically in a greenhouse. Good percentage[78, 200]. Suckers in late autumn to winter[200].

nwatta Succeeds in a well-drained fertile soil in full sun[11, 200]. Judging by the plants natural habitat, it should also succeed in poor acid soils and dry soils[K]. The young growth in spring can be damaged by late frosts. Plants have brittle branches and these can be broken off in strong winds[200]. Plants are also susceptible to coral spot fungus[11]. Plants in this genus are notably resistant to honey fungus[200]. This species is a small suckering shrub, it can spread freely in suitable conditions[K]. There is some confusion over the correct name of this species. It is united with *R. radicans* (under that name) by some botanists whilst others split this species off into another genus, *Toxicodendron*, and unite it with *R. radicans* as *Toxicodendron radicans*[200]. Many of the species in this genus, including this one, are highly toxic and can also cause severe irritation to the skin of some people, whilst other species are not poisonous. It is relatively simple to distinguish which is which, the poisonous species have axillary panicles and smooth fruits whilst non-poisonous species have compound terminal panicles and fruits covered with acid crimson hairs[1, 4]. The toxic species are sometimes separated into their own genus, *Toxicodendron*, by some botanists[200]. Dioecious. Male and female plants must be grown if seed is required.

### 7.2.552 Arisaema ringens

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli nyanhjen hjonli

drutta Arisaema ringens is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Flies. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta None known
dwatta Alternative FebrifugeAlternative, febrifuge[178].
propta Seed - best sown as soon as it is ripe in a shady position in a cold frame[134]. Stored seed remains viable for at least a year and can be sown in spring in the greenhouse but it will probably require a period of cold stratification. Germination usually takes place in 1 - 6 months at 15°c[134]. When

large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least a coupe of years until the corms are more than 20mm in diameter. Plant out into their permanent positions whilst they are dormant. Division of tubers when the plant dies down in late summer.

nwatta Prefers a cool moist peaty soil in the bog, woodland garden or a sheltered border in semi-shade[134, 200]. Prefers a loamy or peaty soil[1] and will tolerate a sunny position if the soil is moist but not water-logged and the position is not too exposed[1, 200]. This is probably one of the hardiest members of the genus and should succeed outdoors in a suitable position in many parts of Britain[90]. Tubers should be planted about 10cm deep[233]. Only plant out full sized tubers and mulch them with organic matter in the winter[200]. Plants need protection from slugs[200]. Most species in this genus are dioecious, but they are sometimes monoecious and can also change sex from year to year.

### 7.2.553 Diphylleia cymosa

Umbrella Leaf, American umbrellaleaf
6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.7 m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Diphylleia cymosa is a PERENNIAL growing to 0.7 m (2ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known
tcanta None known
dwatta Antiseptic Cancer Diaphoretic DiureticA tea made from the roots is antiseptic, diaphoretic and diuretic[222, 257]. An infusion has been used in the treatment of smallpox[257]. This is a very rare plant in the wild, so little research has been carried out into its medicinal virtues. However, it is believed that the root might contain podophyllin, an effective anti-cancer agent[222].

propta Seed - best sown in a cold frame as soon as it is ripe[175]. The seed is very slow to germinate, usually taking a year or more[175]. Sow stored seed as soon as possible in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring.

nwatta Prefers a moist humus-rich soil and semi-shade, growing well in a woodland garden[1, 130, 200]. The leaves are very large and can be up to 60cm across[233].

### 7.2.554 Cyclamen hederifolium

Cyclamen, Alpine Violet, Persian Violet
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.1 m hkuc pcmhmmhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Cyclamen hederifolium is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in leaf from October to June, in flower from July to November, and the seeds ripen from June to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known
tcanta Plants can be used as a ground cover, though they will need to be given a mulch of leaf mould in order to keep the weeds at bay when they are dormant in the summer[208].

dwatta Homeopathy PurgativeThe fresh rootstock is a drastic purgative. It should be used with extreme caution[4, 21, 46]. A homeopathic remedy is made from the fresh root[4]. It is applied externally to the bowels to cause purging[4].

### 7.2.452 Eragrostis pilosa

Soft Love Grass, Indian lovegrass
6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Eragrostis pilosa is a ANNUAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - ground into a flour and used as a cereal[105]. It is generally seen as a famine food, but is used regularly in some areas[177]. The seed is very small and fiddly to utilize[K].

tcanta None known
dwatta VulneraryThe plant is said to be an effective cure for contusions[218].

propta Seed - sow early spring in a greenhouse and only just cover the seed. Germination should take place within 2 weeks. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts. The seed can also be sown in situ in mid to late spring, though in a cool summer it may fail to ripen many seeds[162].

nwatta Succeeds in any good loam or humus-rich soil in a sunny position[162]. Prefers a light soil[1]. Plants are harvested (from the wild?[K]) on a regular basis in E. Africa for their edible seed[177].

### 7.2.453 Coprosma petriei

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.1 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatprik hpa7tmwatli nyanhjen hjonli

drutta Coprosma petriei is an evergreen Shrub growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, and the seeds ripen in August. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Wind. The plant is not self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: FruitEdible Uses: CoffeeFruit - raw or cooked. Sweet, but without much flavour[225]. The fruits vary in colour from white to blue or sea-green[225]. The fruit is seldom borne in Britain[208]. The fruit is about 12mm wide[200]. The roasted seed is an excellent coffee substitute[153].

tcanta DyeA yellow dye is obtained from the wood, it does not require a mordant[153]. A dense carpeting plant, it can be planted about 25cm apart to form a ground cover[208]. The cultivar 'Violet Drops' is much more vigorous than the type, forming compact mats up to 2 metres across and making a very good ground cover[225].

dwatta None known
propta Seed - probably best sown as soon as it is ripe in a greenhouse or cold frame[K]. Sow stored seed in spring in a cold frame[200]. Germination can be slow, often taking more than 12 months even when fresh seed is used[K]. When the seedlings are large enough to handle, prick them out into individual pots. Grow on the plants for at least their first winter in a greenhouse and plant out in late spring or early summer. Give the plants some protection from the cold for their first winter outdoors[K]. Cuttings of mature wood of the current year's growth, autumn in a frame.

nwatta Requires a moist, very well-drained neutral to slightly acid soil in full sun or light shade[201]. Succeeds in most soils, so long as they are well-drained[225]. This plant has survived very dry conditions with us and appears to be very drought tolerant[K]. One of the hardiest members of this genus, it succeeds outdoors in the rock garden in many parts of the country[1]. Hybridizes freely with other members of this genus[200, 225], though it does not seem to cross with *C. pumila*, *C. atropurpurea* or any red-fruited species[225].

There are several named forms selected for their ornamental value[225]. Plants are normally dioecious, though in some species the plants produce a few flowers of the opposite sex before the main flowering and a few hermaphrodite flowers are sometimes produced[225]. Male and female plants must usually be grown if seed is required.

### 7.2.454 Navarretia squarrosa

Skunk Weed, Skunkbush
6 tlin 9 cyuc 1 kcaak 2 tcan 0 dwat 0.3 m hkuc hmimhtut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta Navarretia squarrosa is a ANNUAL growing to 0.3 m (1ft). See above for USDA hardness. It is hardy to UK zone 7. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed - parched, ground into a powder and eaten dry[94]. It is very small and fiddly to use[K].

tcanta Dynamic accumulator.
dwatta None known
propta Seed - sow early spring in situ[200].
nwatta Requires a very sunny position in a very well-drained dry to moist light or medium fertile soil[200].

### 7.2.455 Thymus cilicicus

Cilician Thyme
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.2 m hkuc htut cyutli kyuctcup hwicli hrasjlut hpa7tli priklwis hpa7tmwatli xre7t hjonli

drutta Thymus cilicicus is an evergreen Shrub growing to 0.2 m (0ft 8in) by 0.4 m (1ft 4in). See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Edible Uses: CondimentThe leaves have a lemon scent and are used as a flavouring in food[238].
tcanta Deodorant Disinfectant EssentialAn essential oil is obtained from the leaves.

dwatta Antiseptic Deodorant DisinfectantThe leaves, and especially the essential oil contained in them, are strongly antiseptic, deodorant and disinfectant[200, 238]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Prefers a light, well-drained calcareous soil and a sunny position[200]. This species thrives in stony situations[238]. Plants tolerate occasional walking on and can be grown in cracks in paths, they also succeed on walls[200]. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. Plants are hardy to at least - 10°c[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus

taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 7.2.456 Chimaphila maculata

Spotted Wintergreen, Striped prince's pine, Pipsisewa  
6 tlin 9 cyuc 1 kcaak 2 tcan 3 dwat m hkc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Chimaphila maculata is an evergreen Shrub growing to 0.3 m (1ft) by 0.5 m (1ft 8in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: Leaves Edible Uses: Tea The leaves are used as a snack, being nibbled for their refreshing qualities[183, 257]. In Mexico the herb is used as a catalyst in the preparation of 'tesguino', an alcoholic beverage produced from sprouted maize[183].

tcanta The plants stoloniferous root system, and dwarf spreading habit make it a god ground cover, though it is a difficult plant to establish and grow well[245].

dwatta Analgesic Antibacterial Antisepic Rubefacient Astrigent Cancer Diaphoretic Diuretic Febrifuge Rubefacient Skin Stimulant Tonic Urinary The plant is analgesic, antibacterial, astringent, diaphoretic, diuretic, febrifuge, rubefacient, stimulant and tonic[4, 207, 222, 257]. The plant has an anti-septic influence on the urinary system and is sometimes used in the treatment of cystitis[4]. An infusion of the plant has been drunk in the treatment of rheumatism and colds[257]. A poultice of the root has been used to treat pain[257] whilst the plant has also been used as a wash on ulcers, scrofula and cancers[257]. All parts of the plant can be used, though only the leaves are officinal[4]. The plant is loaded with the biologically active compounds arbutin, sitosterol and ursolic acid[222]. Arbutin hydrolyzes to the toxic urinary antiseptic hydroquinone[222].

propta Seed - very difficult to germinate, see the notes in cultivation details. It is best sown on moist sphagnum peat. As soon as they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Rather difficult because the plant is very sensitive to root disturbance. It is best attempted in the spring as the plant comes into growth[200]. Cuttings of softwood, June in a frame. Use some soil from around an established plant[14].

nwatta Landscape Uses: Ground cover, Woodland garden. Requires a light moist but well-drained lime-free soil and shade from direct sunlight[1]. This species is difficult to propagate and grow in cultivation, mainly because it has certain mycorrhizal associations in the wild and these are necessary if the plant is to thrive[200]. It is best to use some soil collected from around an established plant when sowing seed or planting out into a new position[200]. The plant has wide-spreading fibrous feeding roots and will often die or fail to increase in size if these are disturbed. The flowers are deliciously scented[245]. Special Features: North American native. The plant is heat tolerant in zones 8 through 5. (Plant Hardiness Zones show how well plants withstand cold winter temperatures. Plant Heat Zones show when plants would start suffering from the heat. The Plant Heat Zone map is based on the number of "heat days" experienced in a given area where the temperature climbs to over 86 degrees F (30°C). At this temperature, many plants begin to suffer physiological damage. Heat Zones range from 1 (no heat days) to 12 (210 or more heat days). For example Heat Zone. 11-1 indicates that the plant is heat tolerant in zones 11 through 1.) For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. An evergreen. The plant growth habit is a runner spreading indefinitely by rhizomes or stolons [1-2]. The root pattern is rhizomatous with underground stems sending roots and shoots along their length [1-2].

## 7.2.457 Sedum spathulifolium

Broadleaf Stonecrop, Purdy's stonecrop, Yosemite stonecrop, Stonecrop, Blood Leaf Sedum  
6 tlin 10 cyuc 1 kcaak 0 tcan 1 dwat 0.1 m hkc  
hmimhtut cyutli hqatkyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum spathulifolium is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.5 m (1ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: Leaves Edible Uses: Leaves - raw or cooked. They are best used before the plant flowers[172].

tcanta Can be used as a ground cover plant in a sunny position[197]. It requires weeding for the first year or so[197]. Plants are best spaced about 30cm apart each way[208].

dwatta Antihæmorrhoidal Birthing aid Galactogogue Haemostatic Laxative Salve Sedative The leaves are anti-hæmorrhoidal, galactogogue and haemostatic[257]. The leaves can be eaten, or a poultice of the warmed leaves applied to the breasts, in order to stimulate the milk flow of a nursing mother[257]. The juice of the leaves and stems has been rubbed over bleeding wounds to stop the bleeding[257]. A decoction of the stems has been drunk by a woman in the ninth month of her pregnancy in order to ease childbirth[257]. A decoction of the whole plant has been given to children as a treatment for constipation and has been used as a wash to soothe nervous and irritable babies[257]. The plant is used as a treatment for sore gums[257].

propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Landscape Uses: Alpine garden, Container, Ground cover, Rock garden, Seashore. A very easily grown plant, it succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Tolerates some shade[188]. Established plants are drought tolerant[200]. Succeeds in poor soils and on walls[200]. Hardy to at least -15°C[200]. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233]. Special Features: Attractive foliage, North American native.

## 7.2.458 Arabis serrata

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli xre7t hjonli

drutta Arabis serrata is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

(individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Miscellany/None known  
dwatta Emetic Miscellany Styptic The whole plant is an active styptic for both local and general application[4]. It is said to be a valuable and sure specific in the treatment of hydrophobia[4]. The plant is also diaphoretic, diuretic and sedative[61]. An infusion of the root has been used as an emetic[257].

propta Seed - sow spring in situ. The seed requires plenty of moisture in order to germinate.

nwatta An easily grown plant, it succeeds in most soils but requires a sunny position. Plants often self sow.

## 7.2.548 Coronilla scorpioides

Annual Scorpion Vetch, Yellow crownvetch  
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.4 m hkc  
htut cyutli tcup hwicli hras hpa7tli flatpriklwis hpa7tmwatli  
xre7t hjonli

drutta Coronilla scorpioides is a ANNUAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta Dye/Blue dye like indigo can be obtained by fermentation of the leaves[4].

dwatta Cardiac Cathartic Diuretic Laxative The twigs and leaves have a similar action to the common broom, Cytisus scoparia[4]. They are collected as the plant comes into flower and can be stored for later use. They are diuretic, cardiac, cathartic and laxative[4].

propta Seed - sow early spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in late spring.

nwatta Requires a light well-drained soil in full sun[200].

## 7.2.549 Geranium lucidum

Shining geranium  
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli lwis  
hpa7tmwatli xre7t hjonli

drutta Geranium lucidum is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known  
dwatta Astringent Diuretic The plant is diuretic and astringent[240].

propta Seed - sow spring in situ.  
nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Most members of this genus tolerate a wide range of soil types[200], though this species is said to require a calcareous soil[17]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 7.2.550 Erica x darleyensis

Darley Dale Heath, Cape Heath, Molten Silver Heath, Heather

6 tlin 9 cyuc 0 kcaak 2 tcan 0 dwat 0.6 m hkc  
htut cyutli tcup hwicli hyishrasjlut hpa7tli flatpriklwis  
hpa7tmwatli fyifxre7t hjonli

drutta Erica x darleyensis is an evergreen Shrub growing to 0.6 m (2ft) by 1 m (3ft 3in) at a slow rate. See above for UK hardiness. It is hardy to UK zone 6. It is in leaf

all year, in flower from November to May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate strong winds but not maritime exposure.

kcakta None known  
tcanta Hedge Hedge An admirable dense ground cover plant[182, 208], though it might need weeding for the first year[197]. It can be clipped in spring to give denser growth[197, 208]. Plants should be spaced about 60cm apart each way[208]. Plants can be grown as a low hedge, the cultivar 'Furzey' is often used[29].

dwatta None known  
propta Seed - surface sow in a sandy compost in a cold frame in spring. Keep moist. Prick out the plants as soon as they are large enough to handle and plant them in their permanent positions when they are 5 - 8cm tall[11]. This species is a hybrid and will not breed true from seed. Cuttings of half-ripe wood, 3cm long taken from twiggy lateral growths near the base of the plant, July/August in a frame. Remove the leaves from the bottom part of the stem without causing any damage to the bark. The cuttings root in a few weeks if they are given some bottom heat. Plant out in spring[11]. Layering in spring or autumn. Plants can be 'dropped' and then dug up and divided about 6 - 12 months later. Dropping involves digging up the plant and then replanting it about 15 - 20cm deeper in the soil to encourage roots to form along the stems[78].

nwatta Landscape Uses: Border, Container, Massing, Rock garden, Seashore, Specimen. Requires a light loam[11]. This species tolerates lime in the soil[182, 188] so long as there is plenty of humus[208]. Grows best in a poor soil. Resents dry soils. Prefers an open situation. A very ornamental plant[1], there are many named varieties[182]. Plants are quite fast growing[1]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, All or parts of this plant are poisonous, Extended bloom season in Zones 9A and above. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is branching: a heart root, dividing from the crown into several primary roots going down and out [2-1].

## 7.2.551 Rhus toxicodendron

Eastern Poison Oak  
6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkc  
htut cyutli kyuctcup hwicli hyishrasjlutnyik hpa7tli flatpriklwis  
hpa7tmwatli nyanhjen hjonli

drutta Rhus toxicodendron is a deciduous Shrub growing to 0.6 m (2ft) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from May to June, and the seeds ripen from September to November. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta Edible Parts: Oil Edible Uses: Oil None known  
tcanta Dye Ink Mordant Oil Parasiticide Tannin Varnish The leaves are rich in tannin. They can be collected as they fall in the autumn and used as a brown dye or as a mordant[169]. An oil is extracted from the seeds[4]. It attains a tallow-like consistency on standing and is used to make candles. These burn brilliantly, though they emit a pungent smoke[4]. The milky juice makes an excellent indelible marking ink for linen etc[4, 11]. It is also used as a varnish for boots and shoes[4].

dwatta Antirheumatic Homeopathy Irritant Narcotic Parasiticide Rubefacient Salve Stimulant Poison oak has occasionally been used medicinally, though it is an extremely poisonous plant and great caution should be exercised. Any



prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Divide in early spring.

nwatta Succeeds in most soils[1], preferring one that is rich in humus and a position in semi-shade[233]. An attractive shade tolerant ground cover plant for neutral or acidic soils[200]. Plants seldom flower well in areas such as Britain with cool summers, they need warm dry conditions in late summer in order to ripen well and initiate flower production[200].

### 7.2.543 Asarum blumei

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc pcmhmm cyutli tcup hwicli hrasljutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta Asarum blumei is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known

dwatta Analgesic Antitussive Carminative Expectorant A decoction of the root is analgesic, antitussive, carminative, expectorant and antitussive[147, 174, 218]. It is used in the treatment of sore throats[174].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are hardy to at least -15°c[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200].

### 7.2.544 Geranium wallichianum

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Geranium wallichianum is a PERENNIAL growing to 0.3 m (1ft) by 1.5 m (5ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Dye TanninThe root contains 30% tannin, it is used as a dye[61]. A good dense ground cover plant[197, 200]. Plants should be spaced about 60cm apart each way[208].

dwatta Astringent Odontalgic Poultrice StomachicThe plant has astringent properties[211]. A decoction of the root, mixed with the bark of Prunus cerasoides, is used in the treatment of peptic ulcers[272]. It has been used as a cure for toothache and has been applied externally to the eyes[145, 240]. The juice of the plant is applied to fresh cuts to stem the bleeding[272]. A paste of the plant is used as a poultice to relieve joint pains[272].

propta Seed - sow spring in a cold frame. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up

smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Prefers a position that is cool and moist in the summer but is not heavily shaded[187]. Plants are hardy to at least -20°c[187]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. Some named forms have been selected for their ornamental value[187].

### 7.2.545 Halenia elliptica

Spurred Gentian

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc hmim cyutli tcup hwicli hrasljutnyik hpa7tli frusflat hpa7tmwatli fyifxre7t hjonli

drutta Halenia elliptica is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta The entire plant is used in Tibetan medicine, it is considered to have a bitter taste and a cooling potency[241]. It is cholagogue and febrifuge[241]. It is used in the treatment of liver inflammations, stomach complaints and fevers from contagious diseases[241].

propta Seed - best sown in early spring in a cool greenhouse[200]. Only just cover the seed. Prick out into individual pots once the plants are large enough to handle and plant out in late spring after the last expected frosts.

nwatta Requires a cool, damp soil with a pH of 5 - 6, and a position in light shade with protection from strong winds[200]. Plants are not very hardy outdoors in this country and are best treated as frost-tender annuals[200].

### 7.2.546 Papaver dubium

Long-Head Poppy, Blindeyes

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc htut cyutli tcup hwicli hyihrasljutnyik hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta Papaver dubium is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta DiaphoreticThe plant is sudorific[240].  
propta Seed - sow spring in situ[200].

nwatta Prefers a well-drained sandy loam in a sunny position[1, 200]. Does not do well on wet clay soils but succeeds in most other soils[115]. This species is possibly more tolerant of poor soils than P. rhoeas[17]. Plants usually self-sow freely when growing in suitable conditions so long as the soil surface is disturbed[238]. When growing in cereal fields, poppies decrease the yields of nearby cereal plants[18, 20]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

### 7.2.547 Xanthium spinosum

Spiny Cocklebur

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikhwis hpa7tmwatli fyif hjonli

drutta Xanthium spinosum is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to October, and the seeds ripen from August to October. The species is monoecious

kcakta Edible Parts: LeavesEdible Uses: Young leaves - cooked[177].

tcanta None known  
dwatta None known  
propta Seed - it is best to surface sow the seed as soon as it is ripe in a light position in a cold frame[134]. Seed can also be sown in spring. It usually germinates in 2 - 3 weeks at 21°c[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division after flowering[111]. Very easy, the divisions can be planted out straight into their permanent positions if required. Cuttings in a shady border in summer[1].

nwatta Easily grown in ordinary well-drained soil[1]. A polymorphic species[58]. Plants are stoloniferous[1].

### 7.2.459 Caulophyllum thalictroides

Papoose Root, Blue cohosh

6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.5 m hkuc pcmhmm cyutli tcup hwicli hrasljut hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Caulophyllum thalictroides is a PERENNIAL growing to 0.5 m (1ft 8in) by 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in April, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta Edible Parts: Edible Uses: CoffeeThe roasted seed is a coffee substitute[4, 102, 105, 177]. The seeds are about the size of large peas, but are not produced in abundance[232].

tcanta None known  
dwatta Anthelmintic Antispasmodic Birthing aid Diaphoretic Diuretic Emmenagogue Oxytotoxic SedativePapoose root is a traditional herb of many North American Indian tribes and was used extensively by them to facilitate child birth[207]. Modern herbalists still consider it to be a woman's herb and it is commonly used to treat various gynaecological conditions[254]. An acrid, bitter, warming herb, it stimulates the uterus, reduces inflammation, expels intestinal worms and has diuretic effects[238]. The root is anthelmintic, antispasmodic, diaphoretic, diuretic, emmenagogue, oxytotoxic and sedative[4, 21, 46, 165, 207]. An infusion of the root in warm water is taken for about 2 weeks before the expected birth date in order to ease the birth[207, 213]. This infusion can also be used as an emmenagogue and a uterine stimulant[213]. Papoose root should therefore be used with some caution by women who are in an earlier stage of pregnancy since it can induce a miscarriage or early delivery[222]. The plant is also taken internally in the treatment of pelvic inflammatory disease, rheumatism and gout[238]. It should not be prescribed for people with hypertension and heart diseases[238]. The powdered root can have an irritant action on the mucous membranes, therefore any use of this plant is best under the supervision of a qualified practitioner[238, 268]. The roots are normally harvested in the autumn, because they are at their richest at this time[213], and are dried for later use. The root is harvested in early spring as new growth is beginning and is used to make a homeopathic remedy[232]. It is used especially in childbirth and in some forms of rheumatism[232].

propta Seed - best sown as soon as it is ripe in a shady part of a cold frame[200]. If stored seed is used, it should be sown as soon as it is received. Germination can be erratic. Prick out the seedlings as soon as they are large enough to handle and grow them on in a shady part of a greenhouse or cold frame for at least their first winter. Plant them out into their permanent positions during autumn or early winter. Division in spring or just after flowering[200]. Plants are slow to increase[187].

nwatta Easily grown in a damp light humus-rich woodland soil preferring a position in deep shade[1, 200]. One report says that it is best in a peat garden. Plants are hardy to at least -20°c[187]. The plant only produces one large leaf each year[233]. The seeds rupture the ovary before they are fully ripe and continue to expand naked, they are bright blue when fully ripe[130].

### 7.2.460 Sedum forsterianum

Stonecrop

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.2 m hkuc htut cyutli hगत्युक्तुप hwicli hrasljutnyik hpa7tli flatprikhwis hpa7tmwatli fyifxre7t hjonli

drutta Sedum forsterianum is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from June to July, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: LeavesEdible Uses: Leaves - raw or cooked[2, 46, 105, 115].

tcanta None known  
dwatta None known  
propta Seed - surface sow in spring in well-drained soil in a sunny position in a greenhouse. Do not allow the soil to dry out. Prick out the seedlings into individual pots when they are large enough to handle. If sufficient growth is made, it is possible to plant them out during the summer, otherwise keep them in a cold-frame or greenhouse for their first winter and plant them out in early summer of the following year[K]. Division is very easy and can be carried out at almost any time in the growing season, though is probably best done in spring or early summer. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in most soils[188] but prefers a fertile well-drained soil in a sunny position[200]. Established plants are drought tolerant[200]. Can be grown on a wall[200]. Requires a sunny position[188]. Hardy to about -15°c[200]. This species is closely related to S. reflexum. All members of this genus are said to have edible leaves, though those species, such as this one, that have yellow flowers can cause stomach upsets if they are eaten in quantity[62, 85]. Plants in this genus seem to be immune to the predations of rabbits[233].

### 7.2.461 Hibiscus moscheutos

Swamp Rose Mallow, Crimsoneyed rosemallow, Wild Cotton, Common Rosemallow, Eastern Rosemallow, Swamp  
6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikhwis hpa7tmwatli xre7t hjonli

drutta Hibiscus moscheutos is a PERENNIAL growing to 2.5 m (8ft) by 2 m (6ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Although there are no reports of edibility for this species, most of the plants in this family have edible leaves and flowers[K]. The flowers are about 15cm in diameter[233], though in some cultivars they are up to 25cm in diameter[260]. They have a mild flavour and somewhat mucilaginous texture with a slight bitterness in the aftertaste[K]. The leaves are rather bland and are also mucilaginous, but have a slight hairiness to them which detracts a little from the pleasure of eating them[K].

tcanta None known  
dwatta Demulcent Dysentery Emollient UrinaryThe leaves and roots abound in mucilage[222]. Like many other plants in this family, they are demulcent and emollient and are used in the treatment of dysentery, lung ailments and urinary ailments[222]. An infusion of the dried stalks has been used in the treatment of inflammation of the bladder[257].

propta Seed - sow early spring in a greenhouse. Germination is usually rapid. Prick out the seedlings when they are

large enough to handle and plant them out into their permanent positions in early summer. Some reports say that the seed can be sown in situ outside and that it gives a good rate of germination[78, 80, 113].

nwatta Landscape Uses:Border, Container, Foundation, Specimen. Prefers a well-drained humus rich fertile soil in a sheltered position in full sun[200]. Well-sited to a water-side planting[200]. One report says that the plants are hardy in zone 5 (tolerating winter temperatures down to about -25°C), this same report also says that the plant succeeds outdoors in Britain only in those areas where winter temperatures do not fall below about -5°C[200]. Another report says that it needs to be grown in a warm garden in the warmer areas of Britain[233]. Plants of the cultivar 'Southern Belle' have been seen growing outdoors at Ken Gardens, they are situated on a south-east facing wall of the Temperate House and have been there for at least 3 years as of 2000[K]. A very ornamental plant[1], there are many named varieties[200]. Special Features:North American native, Wetlands plant, Attracts butterflies.

## 7.2.462 Carex kobomugi

Japanese sedge

6 tlin 8 cyuc 1 kcaak 2 tcan 0 dwat 0.2 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli hjonli

drutta Carex kobomugi is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 6. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: Root SeedEdible Uses: Root - cooked[172]. Seed[172]. An emergency food, used when all else fails[177]. The seed is very small and would be fiddly to use[K].

tcanta Environmental Uses: Land reclamation; Landscape improvement; Soil conservation. Possible benefits in using *C. kobomugi* for dune stabilization in its native range, but there are considerable doubts raised about its relative effectiveness compared to native species outside of this range. dwatta None known

propta Seed - sow in situ in the spring in a moist soil in light shade. If seed is in short supply it can be sown in a cold frame and be planted out in the summer. The seed usually germinates in 2 - 6 weeks at 15°C[138]. Division in spring[200]. Very easy, larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in most parts of this country. It is likely to tolerate maritime exposure[K]. The following notes are based on the general needs of the genus. Easily grown in a damp to wet soil in full sun or shade[162, 200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.463 Solidago spectabilis

Nevada Goldenrod

6 tlin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.5 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyikfrp hpa7tli flatprklwissip hpa7tmwatli xre7t hjonli

drutta Solidago spectabilis is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta Edible Parts: SeedEdible Uses: Seed[46, 61, 105, 161, 257]. No more details are given.

tcanta DyeMustard, orange and brown dyes can be obtained from the whole plant[168].

dwatta AntisepticThe leaves and flowering stems are antiseptic. An infusion of the dried powdered herb can be used[168].

propta Seed - sow spring in a cold frame. Only just cover the seed and do not allow the compost to become dry. Prick out the seedlings into individual pots when they are large enough to handle, and grow them on for their first winter in pots. Plant them out into their permanent positions in spring or early summer. Division in spring or autumn. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Succeeds in any moderately fertile moisture retentive soil in sun or semi-shade[200]. Grows well in heavy clay soils. A rather greedy plant, it is apt to impoverish the soil[1]. There is some confusion over the correct identity of this plant. According to [200] it is a native of Western N. America and grows 50cm tall. According to [72] it is a native of South-eastern N. America and grows 120cm tall. [105] lists this species as a synonym of *S. odora*. It is quite possible that two species are involved, one of which is a synonym for *S. odora*. The plant attracts various beneficial insects such as ladybirds, lacewings and hoverflies to the garden, these insects will help to control insect pests in the garden[201, 238].

## 7.2.464 Bergenia ciliata

6 tlin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcup hwicli hyishrasljutnyikfrp hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta Bergenia ciliata is an evergreen Perennial growing to 0.3 m (1ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from March to May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta The flowers are boiled and then pickled[272]. tcanta TanninThe root contains 14 - 16% tannin[272]. A good ground cover plant[188], forming a slowly spreading clump[208, 233].

dwatta Lithontripic Ophthalmic Poultice Tonic UrinaryA juice or powder of the whole plant is used to treat urinary troubles in Nepal[272]. The juice of the leaves is used as drops to relieve earaches[272]. The root is used as a tonic in the treatment of fevers, diarrhoea and pulmonary affections[218, 240, 243]. The root juice is used to treat coughs and colds, haemorrhoids, asthma and urinary problems[272]. Externally, the root is bruised and applied as a poultice to boils and ophthalmia, it is also considered helpful in relieving backache[243, 272]. The root of this plant has a high reputation in indigenous systems of medicine for dissolving stones in the kidneys[240].

propta Seed - surface sow in a greenhouse. Make sure that the compost does not dry out. Two weeks cold stratification can speed up germination which usually takes 1 - 6 months at 15°C[134]. Fresh seed, sown as soon as it is ripe in late spring is liable to germinate better than stored seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in late spring after flowering[188] or in autumn[200]. Very easy, larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta Succeeds in full sun or light shade in most soils[200] but prefers a deep fertile soil that does not dry out fully[134]. Grows well in heavy clay soils. Plants are at their best in a medium-heavy soil[208]. Succeeds in shade

htut cyutli kyuctcup hwicli hyishrasljutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Macromeria viridiflora* is a PERENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known tcanta Miscellany MiscellanyThe plant was collected by the Hopi Indians, dried and mixed with wild tobacco and used in rain-making ceremonies[187].

dwatta Miscellany MiscellanyThe dried plant, combined with mullein (*Verbascum* species) has been smoked in the treatment of craziness and fits[257].

propta Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts

nwatta Requires a well-drained soil and a position in full sun[187]. Plants are hardy to about -15°C[187].

## 7.2.540 Lysimachia paridiformis

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.3 m hkuc hmimhtut cyutli tcuphja7nhs6s hwicli hrasljutnyikfrp hpa7tli flatprklwis hpa7tmwatli fyfexre7t hjonli

drutta *Lysimachia paridiformis* is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil and can grow in water.

kcakta None known

tcanta None known

dwatta Anodyne Antitussive Blood tonic Carminative ExpectoantThe flowering tops, simmered in water, are carminative and diaphoretic[147, 218]. The whole plant is anodyne, antitussive, blood tonic, carminative and expectoant[147, 218]. A decoction is used in the treatment of pulmonary tuberculosis, 'wind-cold' coughing, rheumatoid arthritis, traumatic injuries, stomach ache, enteritis, snake bites and abscess swelling[147]. The fresh herb is also crushed and applied externally as a poultice[147].

propta Seed - sow spring or autumn in a cold frame[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200]. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta An easily grown plant, succeeding in a moist loamy soil[1]. Judging by its native habitat, it should succeed in shallow water. Grows well in heavy clay soils. Most species in this genus seem to be immune to the predations of rabbits[233].

## 7.2.541 Scutellaria lateriflora

Virginian Skullcap, Blue skullcap

6 tlin 9 cyuc 0 kcaak 2 tcan 3 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Scutellaria lateriflora* is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for:

light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta MiscellanyNone known

dwatta Anticonvulsant Antispasmodic Astringent Diuretic Emmenagogue Epilepsy Miscellany Nervine Sedative TonicA commonly used herbal medicine, Virginian skullcap is a very effective nerve that has traditionally been used in the treatment of a wide range of nervous conditions. Its tonic and restorative properties help to support and nourish the nervous system, calming and relieving stress and anxiety[222, 238, 244, 254]. Very little research has been carried out on this species, despite its long use in American and British herbal medicine[244]. Research is sorely needed, and may reveal more uses for this valuable herb[254]. The leaves are antispasmodic, slightly astringent, diuretic, nerve, sedative and strongly tonic[4, 21, 46, 165]. They are harvested in early summer and dried for later use[4]. It is used in the treatment of various problems of the nervous system including epilepsy, insomnia, anxiety, delirium tremens, withdrawal from barbiturates and tranquilisers, and neuralgia[222, 238, 244]. An infusion of the plant has been used to promote suppressed menstruation, relieve breast pain and encourage expulsion of the placenta[213, 254], it should not be given to pregnant women since it can induce a miscarriage[238]. This plant should be used with some caution since in excess it causes giddiness, stupor, confusion and twitching[238]. The plant was once believed of use in the treatment of rabies, though there is no evidence to support this[207, 213].

propta Seed - sow in situ outdoors in late spring. If there is only a small quantity of seed it is better to sow it in a pot in a cold frame in early spring. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the spring. Division in spring just before new growth begins. Very easy, larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer. Basal cuttings in early summer in a frame. Very easy. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Succeeds in a sunny position in any ordinary garden soil that does not dry out during the growing season[200]. Plants are not so long-lived when grown in rich soils[4]. Many of the plants grown under this name in gardens are in fact *S. altissima*[238]. It is important to ensure you have the correct plant if using it medicinally[238]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is fleshy. Thick or swollen - fibrous or tap root [2-1].

## 7.2.542 Reineckia carnea

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.1 m hkuc pcmimhm cyutli tcup hwicli hrasljutnyik hpa7tli flatprklwis hpa7tmwatli xre7t hjonli

drutta *Reineckia carnea* is an evergreen Perennial growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in April. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta A good ground cover for shady positions[200].

dwatta Appetizer Cardiotonic VulneraryThe root is appetizer, cardiotonic and vulnerary[178, 218]. Strengthens the memory[178, 218].

propta Seed - we have no information on this species but suggest sowing the seed as soon as it is ripe in a cold frame if this is possible. Stored seed is likely to be slow to germinate and might take a year or more. Sow it in a cold frame as soon as it is received. When they are large enough to handle,

can be very slow, taking up to 18 months at 15°C[164]. It is best to sow the seed thinly so that it is not necessary to transplant the seedlings for their first year of growth. Apply a liquid fertilizer during their first summer, however, to ensure they get sufficient nourishment. Prick out the seedlings once they are dormant, putting perhaps 2 plants per pot, and grow them on in a greenhouse or frame for at least a couple of years. Plant them out into their permanent positions when they are dormant[K]. The seedlings take 4 - 5 years to reach flowering size[1]. Division of the bulbs in June/July when the leaves have died down[1]. Larger bulbs can be planted out direct into their permanent positions, though it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out. The plant can be divided every other year if a quick increase is required[1].

nwatta Prefers a rich well-drained loam that does not dry out rapidly in summer[1]. Requires a very sunny position[90]. This species is hardy to at least -15°C[200]. Plants can take 4 - 5 years to flower when grown from seed[164]. Plants seem to be immune to the predations of rabbits[233].

## 7.2.536 *Inula britannica*

Xuan Fu Hua, British yellowhead

6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.8 m hkuc htut cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta *Inula britannica* is a PERENNIAL growing to 0.8 m (2ft 7in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist or wet soil.

kcakta None known

tcanta None known

dwatta Antibacterial Antiemetic Cancer Carminative Cholagogue Deobstruent Depurative Diuretic Expectorant Laxative Resolvent Stomachic Tonic VulneraryXuan Fu Hua is used in Chinese herbalism as a mildly warming expectorant remedy and it is especially suitable where phlegm has accumulated in the chest[254]. The flowers are more commonly used, but the leaves are also used, generally for less serious conditions[254]. The leaf is discutient and vulnerary[218]. The flowers are antibacterial, carminative, cholagogue, deobstruent, depurative, diuretic, expectorant, laxative, stomachic and tonic[218]. They are used internally in the treatment of bronchial complaints with profuse phlegm, nausea and vomiting, hiccups and flatulence[176, 238]. The flowers have an antibacterial action, but this can be destroyed by proteins in the body[176]. The plant is harvested when in flower and can be dried for later use[254]. The root is discutient, resolvent and vulnerary[218]. The plant has been mentioned as a possible treatment for cancer of the oesophagus[218].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. If you have sufficient seed, it is worthwhile trying a sowing in situ in the spring or the autumn. Division in spring or autumn[111].

nwatta Succeeds in a sunny position in any moderately fertile well-drained soil[200]. Grows well in heavy clay soils. Plants are hardy to at least -15°C[238]. The sub-species *I. britannica chinensis* is the form used medicinally[238].

## 7.2.537 *Geranium rotundifolium*

Roundleaf geranium

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.4 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis hpa7tmwatli fyifxre7t hjonli

drutta *Geranium rotundifolium* is a ANNUAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for:

light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Astringent DiureticThe plant is used as an astringent and diuretic[240].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 7.2.538 *Thymus camphoratus*

Camphor Thyme

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.4 m hkuc htut cyutli hgatyuctup hwicli hyishrasjlut hpa7tli prikklwis hpa7tmwatli xre7t hjonli

drutta *Thymus camphoratus* is an evergreen Shrub growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta Deodorant Disinfectant EssentialThe essential oil obtained from the leaves is also used in perfumery, as a mouth wash, medicinally etc[200].

dwatta Antiseptic Deodorant DisinfectantAn essential oil obtained from the plant contains thymol, which is strongly antiseptic, deodorant and disinfectant[200]. The plant can be used fresh at any time of the year, or it can be harvested as it comes into flower and either be distilled for the oil or dried for later use[238].

propta Seed - sow spring in a cold frame. Seed can also be sown in autumn in a greenhouse. Surface sow or barely cover the seed. Germination can be erratic. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division in spring or autumn[200]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring. Cuttings of young shoots, 5 - 8cm with a heel, May/June in a frame[200]. Cuttings of half-ripe wood, 5 - 8cm with a heel, July/August in a frame[200]. Layering.

nwatta Prefers a light, well-drained calcareous soil and a sunny position[200]. Plants tolerate occasional walking on and can be grown in cracks in paths, they also succeed on walls[200]. Thymes dislike wet conditions, especially in the winter. A layer of gravel on the soil around them will help protect the foliage from wet soils[238]. The flowers are rich in nectar and are very attractive to honey bees[200]. This is a very difficult genus taxonomically, the species hybridize freely with each other and often intergrade into each other[200].

## 7.2.539 *Macromeria viridiflora*

Giant Trumpets, Thurber's giant-trumpets

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.9 m hkuc

or semi-shade[187]. The leaf colour is best when plants are grown in a poor soil in a sunny position[188]. Dislikes cold winds[197]. The plant is hardy to about -20°C, but the flowers and young leaves are rather sensitive to frost[187] so it is best to choose a position with shade from the early morning sun. This species is only hardy in sheltered gardens of south and west Britain[208]. If the leaves are cut back by frost then they are soon replaced by fresh leaves in the spring[188]. The roots of this plant are commonly collected from the wild for medicinal purposes. Overcollection in many areas of its range are a cause for conservation concern[272]. Plants seem to be immune to the predations of rabbits[233]. The different species of this genus will hybridise freely when grown near each other[233].

## 7.2.465 *Eschscholzia californica*

Californian Poppy

6 tlin 11 cyuc 1 kcaak 2 tcan 3 dwat 0.3 m hkuc htut cyutli kyuctup hwicli hyishrasjlutnyik hpa7tli flatprikwis hpa7tmwatli xre7t hjonli

drutta *Eschscholzia californica* is a PERENNIAL growing to 0.3 m (1ft) by 0.2 m (0ft 8in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in flower from July to September, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves - cooked[46, 61, 161]. This plant is in a family that contains many poisonous plants so some caution is advised in using it. tcanta Perennial groundcover for zone 2 firebreaks. The US government has created a system of firebreaks for areas prone to wildfires, these are separated into concentric zones surrounding buildings. Zone 2 is the second away from the house. These low-level groundcovers provide little fuel.

dwatta Anodyne Antianxiety Antidepressant Antispasmodic Diaphoretic Diuretic Galactofuge OdontalgicThe Californian poppy is a bitter sedative herb that acts as a diuretic, relieves pain, relaxes spasms and promotes perspiration[238]. The whole plant is harvested when in flower and dried for use in tinctures and infusions[238]. It is taken internally in the treatment of nervous tension, anxiety, insomnia and incontinence (especially in children)[238]. The watery sap is mildly narcotic and has been used to relieve toothache[238]. It is similar in its effect to the opium poppy (Papaver somniferum) but is much milder in its action and does not depress the central nervous system[238]. Another report says that it has a markedly different effect upon the central nervous system, that it is not a narcotic but tends to normalize psychological function[254]. Its gently antispasmodic, sedative and analgesic actions make it a valuable herbal medicine for treating physical and psychological problems in children[254]. It may also prove beneficial in attempts to overcome bedwetting, difficulty in sleeping and nervous tension and anxiety[254]. An extract of the root is used as a wash on the breasts to suppress the flow of milk in lactating females[207, 257].

propta Seed - sow in mid spring or late summer to early autumn in a sunny border outdoors and only just cover the seed[200]. Autumn sown plants may require protection from frosts in cold winters[200]. The seed usually germinates in 2 - 3 weeks.

nwatta Landscape Uses:Border, Container, Foundation, Massing, Rock garden. Prefers a poor sandy soil and a sunny position[108, 200] but is easily grown in an ordinary garden soil[1]. Succeeds in a hot dry position. Plants grow well in maritime climates[200]. A very ornamental plant, it is commonly grown in the flower garden and there are many named varieties[200]. This plant is the state flower of California[207]. Although a perennial it is usually quite short-lived and is more often grown as an annual in this country[187, 238]. It can tolerate temperatures down to about -10°C, however, and often survives mild winters[187]. If the dead flowers are removed before they set seed the plant

will continue flowering for a longer period[188]. A polymorphic species[71]. Plants resent root disturbance and should be sown in situ[200]. The flowers are very attractive to bees[108]. They close during wet or overcast weather[238]. Plants often self-sow if the soil is disturbed by some means such as hoeing[200]. Special Features: Attractive foliage, North American native, Naturalizing, Suitable for cut flowers, Extended bloom season in Zones 9A and above. Heat Zone: 9-2.

## 7.2.466 *Artemisia capillaris*

Yin Chen Hao

6 tlin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.5 m hkuc hmimhtut cyutli hgatyuctup hwicli hrasjlut hpa7tli prikklwis hpa7tmwatli xre7t hjonli

drutta *Artemisia capillaris* is a deciduous Shrub growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Wind. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta Edible Parts: LeavesEdible Uses: Leaves and stems - soaked and boiled[177].

tcanta None known

dwatta Antibacterial Anticholesterolemic Antiviral Cholagogue Diuretic Febrifuge Hepatic VasodilatorYin Chen Hao has been used in Chinese herbal medicine for over 2,000 years. It is considered to be a bitter and cooling herb, clearing "damp heat" from the liver and gall ducts and relieving fevers[254]. It is an effective remedy for liver problems, being specifically helpful in treating hepatitis with jaundice[254]. Modern research has confirmed that the plant has a tonic and strengthening effect upon the liver, gallbladder and digestive system[254]. The leaves and young shoots are antibacterial, anticholesterolemic, antiviral, cholagogue, diuretic, febrifuge and vasodilator[147, 176, 178, 218]. An infusion is used internally in the treatment of jaundice, hepatitis, gall bladder complaints and feverish illnesses[238]. Externally it has been applied in the form of a plaster for treating headaches[254]. The plant is harvested in late spring and can be dried for later use[238]. Yin Chen Hao is contraindicated for pregnant women[254].

propta Seed - surface sow from late winter to early summer in a greenhouse[200]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Cuttings of half-ripe wood, July/August in a frame. Division in spring or autumn.

nwatta An easily grown plant, succeeding in a well-drained circumneutral or slightly alkaline loamy soil, preferring a sunny position[1, 200]. Established plants are drought tolerant[200]. Plants are longer lived, more hardy and more aromatic when they are grown in a poor dry soil[245]. This species is probably not hardy in all parts of Britain, it tolerates temperatures down to at least -5°C[238]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.467 *Athyrium yokoscense*

6 tlin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.3 m hkuc pcmhmm cyutli tcuphja7n hwicli hrasjlutnyikfrip hpa7tli frusflatprikwis hpa7tmwatli hjonli

drutta *Athyrium yokoscense* is a FERN growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist or wet soil.

kcakta Edible Parts: LeavesEdible Uses: Very young fronds (croziers) - boiled[177]. Some caution is advised. See the notes above on toxicity.

tcanta None known  
dwatta None known  
propta Spores - surface sow in a pot of sterile compost in a shady part of the greenhouse and keep moist, this is most easily done by putting the pot in a plastic bag. Pot up small clumps of the plants when they are large enough to handle and keep them moist until they are established. Plant out in late spring of the following year. Division in spring as plants come into growth. Larger divisions can be planted straight into their permanent positions whilst smaller clumps are best potted up and kept in a cold frame until they are growing away well.

nwatta An easily grown plant, it is calcifuge and prefers an acid soil with a pH from 4.5 to 6.5, but it tolerates alkaline soils if plenty of leaf mould is added[200]. Grows well in heavy clay soils. Prefers a moist sheltered site with moderately high atmospheric humidity[200]. Succeeds in a semi-shaded bog-garden or in damp woodland, also in garden borders in full or part shade[200]. This species is very variable, partly according to altitudes and habitats[275]. Plants growing on sunny rocks and in high mountains look like *Athyrium rupestre* and may be distinguished as var. *alpicola*[275]. Lowland plants with deeply tripinnatifid leaves may be called var. *dilatatum*[275]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.468 *Deinanthe bifida*

6 tin 9 cyuc 1 kcaak 0 tcan 0 dwat 0.4 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Deinanthe bifida* is a PERENNIAL growing to 0.4 m (1ft 4in) by 0.3 m (1ft) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: Leaves RootEdible Uses: Young leaves - cooked[105, 177]. Root - cooked[105, 177].

tcanta None known  
dwatta None known  
propta Seed - best surface sown as soon as it is ripe in a greenhouse[200]. Do not allow the compost to dry out. Germination usually takes place within 1 - 2 months at 18°C[175]. Surface sow stored seed in early spring. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. When large enough, plant them out in early autumn or in spring. Division in spring[188].

nwatta Requires a cool rich well-drained peaty soil with shelter from the wind[1, 175]. Intolerant of drought[1]. Requires shade, at least from the morning sun, in spring and autumn[175]. A slow-growing plant[188], it does well in a rock garden[188].

## 7.2.469 *Rhododendron anthopogon*

6 tin 9 cyuc 1 kcaak 0 tcan 2 dwat 0.6 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Rhododendron anthopogon* is an evergreen Shrub growing to 0.6 m (2ft) by 0.6 m (2ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta Edible Parts: Edible Uses: TeaThe flowers are used as a tea substitute[272].

tcanta IncenseThe dried leaves are used as incense[272].

dwatta Antitussive Diaphoretic Digestive Febrifuge TonicThe stems and leaves of the sub-species *R. anthopogon hypenanthum* are used in Tibetan herbalism[241]. They

have a sweet, bitter and astringent taste and they promote heat[241]. They are antitussive, diaphoretic and digestive and are used to treat lack of appetite, coughing and various skin disorders[241]. In Nepal, the leaves are boiled and the vapour inhaled to treat coughs and colds[272]. The flowers of the sub-species *R. anthopogon hypenanthum* are also used in Tibetan medicine, having a sweet taste and neutral potency[241]. They are antitussive, febrifuge and tonic, being used in the treatment of inflammations, lung disorders and general weakening of the body[241]. They are also used when water and locality are not agreeable due to a change of environment[241].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[200]. A pH between 4.5 and 5.5 is ideal[1]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. The whole plant is strongly aromatic with a slightly acrid odour, especially when crushed[11]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.470 *Arthromeris wallichiana*

6 tin 9 cyuc 1 kcaak 0 tcan 1 dwat 0.6 m hkuc  
pcimhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Arthromeris wallichiana* is a FERN growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta Edible Parts: LeavesEdible Uses: Tender young fronds - cooked. Used as a vegetable[272].

tcanta None known  
dwatta AntisepticThe root is antiseptic. A paste of the roots is applied as a poultice to wounds and boils[272].

propta Spores - best sown as soon as ripe on the surface of a humus-rich sterilized soil. Keep the compost moist, preferably by putting a plastic bag over the pot. Pot on small clumps of plantlets as soon as they are large enough to handle and keep humid until they are well established. Do not plant outside until the ferns are at least 2 years old and then only in a very well sheltered position. Division in spring[200].

nwatta Tolerates short periods of drought and direct sunlight, but it prefers bright filtered light[200]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.471 *Ruscus aculeatus*

Butcher's Broom - Knee Holly  
6 tin 9 cyuc 1 kcaak 0 tcan 3 dwat 0.8 m hkuc  
pcimhmim cyutli hgatkuyuctcup hwicli hyishrasjlutnyikfrip hpa7tli flatpriklwisslip hpa7tmwatli nyanhjen hjonli

drutta *Ruscus aculeatus* is an evergreen Shrub growing to 0.8 m (2ft 7in) by 1 m (3ft 3in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from January to April, and the seeds ripen from August to March. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown

TonicThis species is one of several that are the source of the medicinal gentian root[46, 61], the following notes are based on the general uses of *G. lutea* which is the most commonly used species in the West[K]. Gentian root has a long history of use as a herbal bitter in the treatment of digestive disorders and is an ingredient of many proprietary medicines. It contains some of the most bitter compounds known and is used as a scientific basis for measuring bitterness[238]. It is especially useful in states of exhaustion from chronic disease and in all cases of debility, weakness of the digestive system and lack of appetite[4]. It is one of the best strengtheners of the human system, stimulating the liver, gall bladder and digestive system[238], and is an excellent tonic to combine with a purgative in order to prevent its debilitating effects[4]. The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic[4, 7, 9, 14, 21, 165, 238]. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia[238]. It should not be prescribed for patients with gastric or duodenal ulcers[238]. The root is harvested in the autumn and dried for later use[4]. It is quite likely that the roots of plants that have not flowered are the richest in medicinal properties[4].

propta Seed - best sown as soon as it is ripe in a light position in a cold frame[200]. It can also be sown in late winter or early spring but the seed germinates best if given a period of cold stratification and quickly loses viability when stored, with older seed germinating slowly and erratically[200, 239]. It is advantageous to keep the seed at about 10°C for a few days after sowing, to enable the seed to imbibe moisture[239]. Following this with a period of at least 5 - 6 weeks with temperatures falling to between 0 and -5°C will usually produce reasonable germination[239]. It is best to use clay pots, since plastic ones do not drain so freely and the moister conditions encourage the growth of moss, which will prevent germination of the seed[239]. The seed should be surface-sown, or only covered with a very light dressing of compost. The seed requires dark for germination, so the pots should be covered with something like newspaper or be kept in the dark[239]. Pot up the seedlings into individual pots as soon as they are large enough to handle and grow on in light shade in the greenhouse for at least their first winter. The seedlings grow on very slowly, taking 2 - 7 years to reach flowering size[239]. When the plants are of sufficient size, place them out into their permanent positions in late spring or early summer. Division in March[111]. Most members of this genus have either a single tap-root, or a compact root system united in a single root head, and are thus unsuitable for division[239]. Cuttings of basal shoots in late spring[238].

nwatta In general, gentians require a moist well-drained soil in a sheltered position, a certain minimum of atmospheric humidity, high light intensity but a site where temperatures are not too high[239]. They are therefore more difficult to grow in areas with hot summers and in such a region they appreciate some protection from the strongest sunlight[200, 239]. Most species will grow well in the rock garden[200]. This species requires a stony soil with perfect drainage[239]. It is best given some protection from winter wet[239]. This plant has a reputation for not being hardy in Britain[239], though this is more likely to be connected to excess moisture than to low temperatures. Plants are intolerant of root disturbance[200].

## 7.2.533 *Delphinium caeruleum*

6 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Delphinium caeruleum* is a PERENNIAL growing to 0.3 m (1ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta Parasiticide ParasiticideA parasiticide is obtained from the leaves and roots[51, 61]. It is quite toxic and so is for external use only.

dwatta Parasiticide ParasiticideThe roots have been used to kill maggots in the wounds of goats[240].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°C[200]. Temperatures above 15°C inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Prefers a rich well-drained soil that stays moist in the summer[111, 187]. Dislikes water-logged soils[200], it is liable to die out in heavy soils over winter[111]. Requires an open sunny position[188]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.534 *Swertia petiolata*

6 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.6 m hkuc  
hmim cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Swertia petiolata* is a PERENNIAL growing to 0.6 m (2ft) by 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcaakta None known  
tcanta None known

dwatta Antiinflammatory Febrifuge HepaticThe entire plant is used in Tibetan medicine, it is considered to have a bitter taste and extremely cooling potency[241]. It is anti-inflammatory, febrifuge and liver tonic[241]. It is used in the treatment of scleritis, inflammation of the liver and high blood pressure, inflammation of the stomach and liver[241].

propta Seed - sow spring in temperatures not exceeding 10°C in a humus-rich medium[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them Tu in early summer.

nwatta Succeeds in a moist humus-rich soil in damp light woodlands, stream-sides or the bog garden[200]. Grows best in areas with cool summers[200].

## 7.2.535 *Colchicum luteum*

6 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.1 m hkuc  
htut cyutli tcup hwicli jlut hpa7tli flatpriklwis hpa7tmwatli fyfxre7t hjonli

drutta *Colchicum luteum* is a BULB growing to 0.1 m (0ft 4in) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf from March to June, in flower from May to July, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta The following notes are for *C. autumnale*. Since this plant also contains colchicine it can be assumed that it has the same uses[K]. The poisonous alkaloid 'colchicine' is extracted from this plant and used to alter the genetic make-up of plants in an attempt to find new, improved varieties[148]. It works by doubling the chromosome number[89].

dwatta Alterative Anodyne Aphrodisiac Carminative LaxativeThe corms are alterative, aphrodisiac, carminative and laxative[240]. They are used in India to treat gout, rheumatism and diseases of the liver and spleen[240]. They contain the toxic alkaloid 'colchicine' which is used externally to relieve pain[211, 240]. The dried corms contain around 0.25% colchicine and the seed about 0.4%[240].

propta Seed - best sown as soon as it is ripe in early summer in a seed bed or a cold frame[1, 164]. Germination

## 7.2.530 Hyoscyamus albus

White Henbane

6 tin 9 cyuc 0 kcak 0 tcan 4 dwat 0.9 m hkuc  
htut cyutli kyuctup hwicli hrasljutnyik hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Hyoscyamus albus is a ANNUAL/BIENNIAL growing to 0.9 m (3ft). See above for USDA hardiness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Anodyne Antispasmodic Diuretic Epilepsy Hallucinogenic Hypnotic Mydriatic Narcotic Sedative Urinary-Henbane has a very long history of use as a medicinal herb, and has been widely cultivated to meet the demand for its use[4]. It is used extensively as a sedative and pain killer and is specifically used for pain affecting the urinary tract, especially when due to kidney stones[254]. Its sedative and antispasmodic effect makes it a valuable treatment for the symptoms of Parkinson's disease, relieving tremor and rigidity during the early stages of the disease[254]. This species is generally considered the best for internal use, whilst the black henbane (*H. niger*) is the form most used externally[4]. All parts of the plant, but especially the leaves and the seeds, can be used - they are anodyne, antispasmodic, mildly diuretic, hallucinogenic, hypnotic, mydriatic, narcotic and sedative[4, 9, 13, 21, 100, 165, 192, 218]. The plant is used internally in the treatment of asthma, whooping cough, motion sickness, Meniere's syndrome, tremor in senility or paralysis and as a pre-operative medication[238]. Henbane reduces mucous secretions, as well as saliva and other digestive juices[254]. Externally, it is used as an oil to relieve painful conditions such as neuralgia, dental and rheumatic pains[238, 254].The leaves should be harvested when the plant is in full flower and they can then be dried for later use[4]. This is a very poisonous plant that should be used with great caution, and only under the supervision of a qualified practitioner[21, 238]. See the notes above on toxicity. The seed is used in the treatment of asthma, cough, epilepsy, myalgia and toothache[218].

propta Seed - best sown as soon as it is ripe, older seed rapidly loses viability[200]. Either sow in situ or pot up the seedlings whilst still small because plants produce a long taproot and older plants resent root disturbance[200].

nwatta Prefers a hot dry position[200] in a wall or rock crevice[187]. Succeeds in a well-drained fertile soil, preferably of an alkaline nature, in full sun[200]. Grows well in maritime areas[200]. Plants are possibly hardy to about -10°C[187], they are unlikely to succeed in the colder areas of Britain. Self-sows freely, it can be grown in wild informal areas of the garden[200].

## 7.2.531 Atropa bella

Deadly Nightshade, Belladonna

6 tin 9 cyuc 0 kcak 0 tcan 3 dwat 0.9 m hkuc  
pcimhmihhut cyutli tcup hwicli hrasljut hpa7tli flatprikli-wisslip hpa7tmwatli xre7t hjonli

drutta Atropa bella-donna is a PERENNIAL growing to 0.9 m (3ft) by 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Soil reclamationThis species has been found to be effective in removing PCB's from the soil and detoxifying them[248]. The plant is more effective in doing this if it is infected with the bacterial parasite *Agrobacterium tumefaciens*[248].

dwatta Analgesic Antidote Antispasmodic Diuretic Hallucinogenic Homeopathy Mydriatic Narcotic Sedative UrinaryAlthough it is poisonous, deadly nightshade has a long history of medicinal use and has a wide range of applications, in particular it is used to dilate the pupils in eye operations, to relieve intestinal colic and to treat peptic ulcers[254]. The plant can be used to treat the symptoms of Parkinson's disease, reducing tremors and rigidity whilst improving speech and mobility[254]. It has also been used as an antidote in cases of mushroom or toadstool poisoning[7]. This is a very poisonous plant, it should be used with extreme caution and only under the supervision of a qualified practitioner[238]. See also the notes above on toxicity. All parts of the plant are analgesic, antidote, antispasmodic, diuretic, hallucinogenic, mydriatic, narcotic and sedative[4, 7, 9, 21, 46, 165, 171, 192, 240]. The root is the most active part of the plant, it is harvested in the autumn and can be 1 - 3 years old, though the older roots are very large and difficult to dig up[4, 7]. The leaves are harvested in late spring and dried for later use[7]. All parts of the plant contain tropane alkaloids[254]. The leaves contain on average 0.4% active alkaloids, whilst the root contains around 0.6%[240]. The alkaloid content also varies according to the development of the plant, being low when the plant is flowering and very high when bearing green berries[240]. These alkaloids inhibit the parasympathetic nervous system which controls involuntary body activities. This reduces saliva, gastric, intestinal and bronchial secretions, as well as the activity of the urinary tubules, bladder and intestines[254]. An extract of the plant has been used as eyedrops. It has the effect of dilating the pupils thus making it easier to perform eye operations[4, 232]. In the past women used to put the drops in their eyes in order to make them look larger and thus 'more beautiful'[4, 232]. The entire plant, harvested when coming into flower; is used to make a homeopathic remedy[232]. This is used especially in cases where there is localised and painful inflammation that radiates heat[232]. It is also used to treat sunstroke and painful menstruation[238].

propta Seed - best sown as soon as it is ripe in a cold frame. Germination of stored seed is slow and erratic, usually taking 1 - 6 months at 10°C[134, 200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of softwood terminal shoots in spring[200]. Root cuttings in winter[200].

nwatta Succeeds in any well-drained moisture retentive soil[200] in sun or partial shade[238]. Prefers a calcareous soil[1, 4, 9, 13]. When grown as a medicinal plant, the highest levels of the medically active alkaloids are obtained from plants growing on a light, permeable chalky soil, especially when on a south-west facing slope[4]. The highest concentrations are also formed when the plant is growing in a sunny position and in hot summers[238]. The northerly limits of cultivation are about 50 - 55° north and at an altitude between 100 - 200 metres[4]. This species is widely cultivated, especially in eastern Europe, for the medically active compounds it contains. These are used in the drugs industry to produce a range of medicines[238]. Plants tend to be short-lived[200]. Slugs are very fond of this plant and have been known to completely remove the outer bark from the stems[K].

## 7.2.532 Gentiana kurroo

6 tin 9 cyuc 0 kcak 0 tcan 3 dwat 0.2 m hkuc  
hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Gentiana kurroo is a PERENNIAL growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bumblebees, butterflies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Anthelmintic Antiinflammatory Antiseptic Bitter Cholagogue Emmenagogue Febrifuge Refrigerant Stomachic

if seed is required). and is pollinated by Insects. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil and can tolerate drought.

kcakta Edible Parts: StemEdible Uses: CoffeeYoung shoots - cooked[1, 2, 4, 5, 8, 11]. They are harvested in the spring as they grow through the soil and used as an asparagus substitute[7, 183]. The taste is pungent and rather bitter[132, 183]. The roasted seed is a coffee substitute[1, 105, 183].

tcanta Broom ScourerMature shoots are bound into bunches and used as scourers or as besoms[4, 6, 8, 11, 100, 182].

dwatta Antipruritic Aperient Deobstruent Depurative Diaphoretic Diuretic VasoconstrictorButcher's broom is little used in modern herbalism but, in view of its positive effect upon varicose veins and haemorrhoids, it could be due for a revival[254]. The root is aperient, deobstruent, depurative, diaphoretic, diuretic and vasoconstrictor[4, 7, 238]. It has been taken internally in the past in the treatment of jaundice, gout, and kidney and bladder stones, at the present time it is used to treat venous insufficiency and haemorrhoids[238]. It should not be prescribed for patients with hypertension[238]. It is also applied externally in the treatment of haemorrhoids[238]. The root is harvested in the autumn and dried for later use[4]. The whole plant is also sometimes used[4]. This remedy should not be given to people with high blood pressure[254]. The plant contains saponin glycosides, including ruscogenin and neuroscogenin. These substances are anti-inflammatory and cause the contraction of blood vessels, especially veins[254]. The German Commission E Monographs, a therapeutic guide to herbal medicine, approve *Ruscus aculeatus* for haemorrhoids (piles) and venous conditions (see [302] for critics of commission E) [301].

propta Seed - sow the seed thinly in early spring in a cold frame in light shade. The seed germinates better if it is given a period of cold stratification. Germination can be rather slow, sometimes taking 12 months or more. Grow the seedlings on in the pot in light shade in the greenhouse for their first growing season, giving occasional liquid feeds to ensure they do not suffer nutrient deficiencies. Prick them out into individual pots in the following spring and grow them on for at least another year in the pots before planting them out in early summer. Be very sure to protect the seedlings from slugs[K]. Division as the plant comes into growth in early spring[186]. Larger divisions can be planted out direct into their permanent positions. We have found it best to pot up the smaller divisions and grow them on in a lightly shaded position in a cold frame, planting them out once they are well established in the summer.

nwatta Tolerant of most soils[11], including chalky and heavy clay soils[200]. Prefers a shady position[1, 31], tolerating dense dry shade and bad growing conditions[186], including the drip-line of trees[182]. Dislikes much wetness at the roots[186]. Established plants are drought resistant[186]. A very hardy plant, when fully dormant it can tolerate temperatures down to about -25°C[187]. Plants have a slowly creeping tough rootstock and eventually form large clumps[187]. Plants in this genus are notably resistant to honey fungus[200]. Plants are unusual in that the flowers are produced from the middle of the leaf[4]. Although normally dioecious, some hermaphrodite forms are known[200]. One of these is called 'Sparkler'. Male and female plants must usually be grown if seed is required.

## 7.2.472 Mandragora officinarum

Mandrake

6 tin 9 cyuc 1 kcak 0 tcan 2 dwat 0.1 m hkuc  
hmimhtut cyutli kyuctup hwicli hrasljut hpa7tli flatprik hpa7tmwatli fyixre7t hjonli

drutta Mandragora officinarum is a PERENNIAL growing to 0.1 m (0ft 4in) by 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf from March to July, in flower from March to April, and the seeds ripen from July to August. The species is

hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta Edible Parts: FruitEdible Uses: Fruit - raw or cooked. A delicacy[89]. The fruit is about the size of a small apple, with a strong apple-like scent[4]. Caution is advised in the use of this fruit, it is quite possibly poisonous[K].

tcanta None known

dwatta Cathartic Emetic Hallucinogenic NarcoticMandrake has a long history of medicinal use, though superstition has played a large part in the uses it has been applied to. It is rarely prescribed in modern herbalism[238], though it contains hyoscyne which is the standard pre-operative medication given to soothe patients and reduce bronchial secretions[244]. It is also used to treat travel sickness[244]. The fresh or dried root contains highly poisonous alkaloids and is cathartic, strongly emetic, hallucinogenic and narcotic[4, 21, 46, 192, 244]. In sufficient quantities it induces a state of oblivion and was used as an anaesthetic for operations in early surgery[238]. It was much used in the past for its anodyne and soporific properties[4]. In the past, juice from the finely grated root was applied externally to relieve rheumatic pains, ulcers and scrofulous tumours[244]. It was also used internally to treat melancholy, convulsions and mania[244]. When taken internally in large doses, however, it is said to excite delirium and madness[4]. The root should be used with caution, and only under the supervision of a qualified practitioner[21, 238]. See the notes above on toxicity. The leaves are harmless and cooling. They have been used for ointments and other external applications to ulcers etc[4].

propta Seed - best sown in a cold frame in the autumn[188]. The seed can also be sown in spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Root cuttings in winter[200]. Division. This can be rather difficult since the plants resent root disturbance.

nwatta Prefers a deep humus-rich light soil and a sheltered position in full sun[238]. It also tolerates some shade[200]. Prefers a circumneutral soil[200] and dislikes chalk or gravel[4]. Plants are liable to rot in wet or ill-draining soils[4]. Plants are hardy to about -15°C[187]. The roots are somewhat carrot-shaped and can be up to 1.2 metres long[4]. Plants are intolerant of root disturbance and should be put out into their permanent positions as soon as possible[188]. The root often divides into two and is vaguely suggestive of the human body. In the past it was frequently made into amulets which were believed to bring good fortune, cure sterility etc[244]. There is a superstition that if a person pulls up this root they will be condemned to hell[244]. Therefore in the past people have tied the roots to the bodies of animals and then used these animals in order to pull the roots out of the soil.

## 7.2.473 Abies spectabilis

Himalayan Fir

6 tin 9 cyuc 0 kcak 0 tcan 2 dwat 30 m hkuc  
pcimhmihhut cyutli tcup hwicli hrasljutnyikrip hpa7tli flatprik hpa7tmwatli hjonli

drutta *Abies spectabilis* is an evergreen Tree growing to 30 m (98ft 5in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Essential Fuel Incense WoodAn essential oil is obtained from the plant, though the report does not give yields or uses[240]. The dried leaves, mixed with other ingredients, are used in making incense[272]. The wood is used

for construction and thatching roofs[272]. It is also used for fuel[272].

dwatta Antiperiodic Astringent Carminative Expecto- rant Stomachic TonicThe leaves are astringent, carminative, expectorant, stomachic and tonic[240]. The leaf juice used in the treatment of asthma, bronchitis etc[240, 243, 272]. An essential oil obtained from the leaves is used to treat colds, rheumatism and nasal congestion[272]. The leaf juice is antiperiodic[240, 243].

propta Seed - sow early February in a greenhouse or outdoors in March[78]. Germination is often poor, usually taking about 6 - 8 weeks[78]. Stratification is said to produce a more even germination so it is probably best to sow the seed in a cold frame as soon as it is ripe in the autumn[80, 113]. The seed remains viable for up to 5 years if it is well stored[113]. When large enough to handle, prick the seedlings out into individual pots and grow them on for at least their first winter in pots. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Alternatively, if you have sufficient seed, it is possible to sow in an outdoor seedbed. One report says that it is best to grow the seedlings on in the shade at a density of about 550 plants per square metre[78] whilst another report says that they are best grown on in a sunny position[80].

nwatta Prefers a good moist but not water-logged soil[1]. Grows well in heavy clay soils. Plants are very shade tolerant, especially when young, but growth is slower in dense shade[81]. Intolerant of atmospheric pollution[1]. Prefers slightly acid conditions down to a pH of about 5[200]. Prefers growing on a north-facing slope[200]. This species is unsatisfactory in south-eastern Britain due to damage by late frosts, trees rarely live more than 40 years and have a poor thin crown[185]. Trees grow far better in the milder and moister western side of the country[11]. Young trees are very slow to establish because they are often damaged by late frosts, it is best to grow the young trees in high shade to get them through this time[1, 185]. Trees should be planted into their permanent positions when they are quite small, between 30 and 90cm in height. Larger trees will check badly and hardly put on any growth for several years. This also badly affects root development and wind resistance[200]. Plants are strongly outbreeding, self-fertilized seed usually grows poorly[200]. They hybridize freely with other members of this genus[200].

## 7.2.474 Platanus orientalis

Oriental Plane, Oriental planetree

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 30 m hkuc htut cyutli hgattcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Platanus orientalis is a deciduous Tree growing to 30 m (98ft) by 30 m (98ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May, and the seeds ripen from October to February. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure. It can tolerate atmospheric pollution.

kcakta None known

tcanta Dye WoodA fabric dye is obtained from the branches and roots[7]. The colour is not given[K]. Wood - tough, difficult to split, not durable. It is not esteemed for carpentry, but has certain advantages in cabinet making[7], it is also used for inlay work and wood pulp[46, 61, 89].

dwatta Astringent Dysentery Ophthalmic VulneraryThe leaves are astringent and vulnerary[7]. The fresh leaves are bruised and applied to the eyes in the treatment of ophthalmia[240]. A decoction is used to treat dysentery and a cream made from the leaves is used to heal wounds and chilblains[7]. The leaves are harvested in the spring and summer and can be dried for later use[7]. The bark is boiled in vinegar and then used in the treatment of diarrhoea, dysentery, hernias and toothache[240].

propta Seed - two months cold stratification improves germination[113]. Sow spring in a cold frame in light shade[78, 98]. Home grown seed is often of poor quality and low viability. It is best to harvest the seed in late winter or

spring and then sow it immediately in a cold frame[80]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of mature wood of the current years growth, 20 - 30 cm with a heel, autumn in a cold frame[1]. Easy[200]. Layering of stools in spring or autumn. Takes 12 months[78].

nwatta Requires a sunny position in a deep fertile well-drained soil[188]. A fast growing species, established plants are drought tolerant[200]. Tolerates atmospheric pollution and compacted soils[200]. This species is hardy in most areas of Britain but the trees do not do well in northern parts of the country, requiring hotter summers than are normally experienced there[98]. A very ornamental and very long lived tree[1]. It is immune to 'Plane tree wilt' fungus[11]. Very tolerant of root disturbance, trees up to 5 metres tall can be moved quite easily[200].

## 7.2.475 Ilex rotunda

Kurogane holly

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 20 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Ilex rotunda is an evergreen Tree growing to 20 m (65ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year; in flower in April, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required), and is pollinated by Bees. The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta DepurativeThe stem bark is detoxicant[218]. The plant is used in a mixture with other herbs for its haemostatic action[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. It can take 18 months to germinate. Stored seed generally requires two winters and a summer before it will germinate and should be sown as soon as possible in a cold frame. Scarification, followed by a warm stratification and then a cold stratification may speed up the germination time[78, 80]. The seedlings are rather slow-growing. Pot them up into individual pots when they are large enough to handle and grow them on in light shade in a cold frame for their first year. It is possible to plant them out into a nursery bed in late spring of the following year, but they should not be left here for more than two years since they do not like being transplanted. Alternatively, grow them on in their pots for a second season and then plant them out into their permanent positions in late spring or early summer. Give them a good mulch and some protection for their first winter outdoors. Cuttings of almost ripe wood with a heel, August in a shaded position in a cold frame. Leave for 12 months before potting up. Layering in October. Takes 2 years[78].

nwatta Succeeds in most soils so long as they are not water-logged[200]. This species should be hardy in many areas of Britain, especially if provenances from the northern end of its range in Japan are obtained[11]. Resents root disturbance, especially as the plants get older[11]. It is best to place the plants into their permanent positions as soon as possible, perhaps giving some winter protection for their first year or two[K]. Plants are very tolerant of pruning and can be cut right back into old wood if required[188]. Dioecious. Male and female plants must be grown if seed is required.

## 7.2.476 Pterocarya stenoptera

Chinese wingnut

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 20 m hkuc htut cyutli tcup hwicli jlutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Pterocarya stenoptera is a deciduous Tree growing to 20 m (65ft) by 15 m (49ft). See above for USDA har-

dwatta A very toxic plant that is considered to be useful for reducing blood pressure in various conditions of hypertension[213]. The root contains the alkaloids nervine, pseudo-nervine and veratridine[213]. It is best to harvest the root in the autumn and dry it for later use[213]. This species has similar medicinal properties to the black hellebore, *H. niger*[4]. These properties are:- Black hellebore is a very poisonous plant that is toxic when taken in all but the smallest doses. As such it should not be taken except under professional supervision. The plant contains cardiac glycosides which have a similar action to the foxglove (*Digitalis spp*) and it has been used as a heart stimulant for the elderly, though this treatment is no longer recommended[254]. The root is anthelmintic, cardiac, cathartic, diuretic, emetic, emmenagogue, irritant, violently narcotic and a drastic purgative[4, 9, 21, 46, 240]. It is harvested in the autumn and dried for later use[4]. It has been used in the treatment of dropsy, amenorrhoea, nervous disorders and hysteria, but it is very poisonous and great care must be taken over the dosage[4]. The root is also applied externally as a local irritant[4], but even this should be done with care, see notes above on toxicity. A homeopathic remedy is made from the roots[9]. It is used in the treatment of headaches, psychic disorders, enteritis and spasms[9].

propta Seed - best sown as soon as it is ripe in a cold frame[1, 134]. Sow stored seed as early in the year as possible[1], it usually germinates in the autumn to spring. Seed can take 18 months to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a lightly shaded position in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. This species produces flowering plants in 2 - 3 years from seed[200]. It is not possible to divide this species, but it is possible to take basal cuttings of young vegetative shoots[200]. Harvest the shoots when they are about 10cm long with plenty of underground stem. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer.

nwatta Landscape Uses:Container, Massing, Rock garden, Woodland garden. Succeeds in any good garden soil[1], preferring a moist well-drained rich loam in a sheltered position in partial shade[1, 4, 31, 111]. Plants are suitable for naturalizing in a woodland garden[200] and also succeed in the shade of a north-facing wall[233]. They do not object to lime[1]. Grow well in heavy clay soils[200]. Dislikes drought. The stems live for one or two years, dying after flowering[200]. Slugs are very fond of this plant and it will probably require some protection from them[187]. The various species in this genus hybridize freely[95]. There are some named forms, selected for their ornamental value[200]. The whole plant, especially when bruised, gives off an unpleasant smell that is similar to decaying meat[245]. Plants resent root disturbance and should be placed in their permanent positions whilst still small[200]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Special Features: Attractive foliage, Not North American native, Naturalizing, All or parts of this plant are poisonous, Suitable for cut flowers, Flowers have an unpleasant odor.

## 7.2.528 Agapanthus campanulatus

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli hgattcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Agapanthus campanulatus is an evergreen Bulb growing to 0.6 m (2ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf all year, in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil and can tolerate drought. The plant can tolerate maritime exposure.

kcakta None known

tcanta None known

dwatta Cardiac StomachicCardiac, stomachic[61].

propta Seed - best sown in a greenhouse as soon as it is ripe[200], it can also be sown in a greenhouse in March/April[133]. The seed usually germinates in 1 - 3 months at 18°C[133], do not sow it too thickly so that it is possible to grow the seedlings on in their pot without disturbing them for their first year of growth. Give occasional liquid feeds to make sure they do not become nutrient deficient. Divide the seedlings up into individual pots in the spring following germination, grow them on for a further year in the greenhouse and then plant them out into their permanent positions in late spring or early summer. Seedlings take 2 - 3 years to flower[133]. Division of offsets in April/May. Do not move plants between October and March[175]. Division is very easy in the growing season, the divisions can be planted straight out into their permanent positions if required.

nwatta Succeeds in most soils[175] but it prefers a light very well-drained porous soil with plenty of leaf-mould[200]. Requires plenty of moisture during the growing season but it needs to be kept dry in the winter[1, 200]. Another report says that it is drought resistant when established[190]. It only flowers freely when growing in a very sunny position[175]. Plants succeed in maritime gardens[233]. The rhizomes are best planted only just below soil level - a mulch of gravel or stone chips will help to keep the crown of the plant free from excess moisture[282]. Plants are probably hardy to about -15°C[187], but are best if given a good mulch should temperatures lower than -5°C occur[200]. Some plants growing in Essex have their leaves killed by the first frosts of the autumn but the clumps are unharmed[190]. Hybridizes very freely with other members of this genus - some botanists say there is only one very variable species of *Agapanthus*[200]. A number of named varieties have been selected for their ornamental value[187]. Plants seem to be immune to the predations of rabbits[233]. The flowering stems lean towards the sun[175].

## 7.2.529 Onosma echioides

Onosma

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc htut cyutli hgatyuctcup hwicli hrasjlut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Onosma echioides is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcakta None known

tcanta DyeA red dye is obtained from the root. It is an alkanna substitute[46, 61].

dwatta Alternative Laxative Poulitce StimulantThe leaves are alterative[240]. They are made into a powder and given to children as a purgative[240]. The flowers are used as a cordial and stimulant in the treatment of rheumatism and palpitations of the heart[240]. The root is bruised and used as an external application to skin eruptions[240].

propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse in early spring. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in the greenhouse for at least their first winter. Plant them out in early summer. Cuttings in a frame in the summer. Shade them for the first 10 - 12 days[1].

nwatta Requires a well-drained soil in full sun[1, 187]. Prefers a deep rather rich sandy loam[1]. Best grown in a crevice in a rock garden or on a wall[1, 187]. Tolerates hot dry conditions and also drought once it is established, but disliking winter wet[190]. Plants also dislike wet summers[200]. Hardy to about -15°C[187]. There is some confusion over this species. It is given as a part of *O. frutescens* in some reports but [200] gives it specific status. A very ornamental plant[1].



possible in late winter or early spring. The seed usually germinates in 1 - 6 months at 15°c[133]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first year. When the plants are large enough, plant them out in the spring. Division in late summer after the plant dies down.

nwatta Succeeds in ordinary garden soil but prefers a moist well-drained woodland soil[1, 200]. Prefers a moist peaty soil in some shade[187]. Tolerates drought during its summer dormancy[200]. Hardy to at least -20°c[187]. This species is very closely related to *A . grayi* , *A . lancifolia* , *A . lyallii* , *A . oregana* , and *A . Piperi*. This species complex also shares close morphologic affinities with both European species such as *A . nemorosa* and Asian species such as *A . Altaica*[270] Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. A good woodland plant[1, 187].

## 7.2.525 Colchicum autumnale

Autumn Crocus, Meadow Saffron,

6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.2 m hkuc  
pchimhim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwis  
hpa7tmwatli fyfxre7t hjonli

drutta Colchicum autumnale is a BULB growing to 0.2 m (0ft 8in) by 0.2 m (0ft 8in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 5 and is not frost tender. It is in leaf from February to July, in flower from August to October, and the seeds ripen from April to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Plant breedingThe poisonous alkaloid 'colchicine' is extracted from this plant and used to alter the genetic make-up of plants in an attempt to find new, improved varieties[9, 13, 19, 46, 100, 171]. It works by doubling the chromosome number[89].

dwatta Analgesic Antirheumatic Cathartic Emetic HomeopathyThough known since at least the time of the ancient Greeks, autumn crocus was considered too poisonous to use medicinally and it was not until research in the Eighteenth century that the plant was discovered to be of value in the treatment of gout[268]. In modern herbalism it is still used to relieve the pain and inflammation of acute gout and rheumatism, although frequent use has been known to encourage more frequent attacks of the complaint[232, 268]. Both the corm and the seeds are analgesic, antirheumatic, cathartic and emetic[4, 7, 13, 21, 235]. They are used mainly in the treatment of gouty and rheumatic complaints, usually accompanied with an alkaline diuretic[4]. Leukaemia has been successfully treated with autumn crocus, and the plant has also been used with some success to treat Bechet's syndrome, a chronic disease marked by recurring ulcers and leukaemia[254]. A very toxic plant, it should not be prescribed for pregnant women or patients with kidney disease, and should only be used under the supervision of a qualified practitioner[238]. See also the notes above on toxicity. The seeds are harvested in early summer, the corms in mid to late summer when the plant has fully died down. They are dried for later use[238]. The fresh bulb is used to make a homeopathic remedy[232]. It is used in the treatment of nausea, diarrhoea and rheumatism[232].

propta Seed - best sown as soon as it is ripe in early summer in a seed bed or a cold frame[1, 164]. Germination can be very slow, taking up to 18 months at 15°c[164]. It is best to sow the seed thinly so that it is not necessary to transplant the seedlings for their first year of growth. Apply a liquid fertilizer during their first summer, however, to ensure they get sufficient nourishment. Prick out the seedlings once they are dormant, putting perhaps 2 plants per pot, and grow them on in a greenhouse or frame for at least a couple of years. Plant them out into their permanent positions when they are dormant[K]. The seedlings take 4 - 5 years to reach flowering size[1]. Division of the bulbs in June/July when the

leaves have died down[1]. Larger bulbs can be planted out direct into their permanent positions, though it is best to pot up the smaller bulbs and grow them on in a cold frame for a year before planting them out. The plant can be divided every other year if a quick increase is required[1].

nwatta Landscape Uses:Alpine garden, Border, Foundation, Massing, Rock garden, Specimen. Prefers a rich well-drained loam in a sunny position[1, 188]. Tolerates partial shade but dislikes dry soils[1]. Tolerates a pH in the range 4.5 to 7.5. Plants are hardy to about -20°c[200]. The dormant bulbs are fairly hardy and will withstand soil temperatures down to at least -5°c[214]. The autumn crocus is easily grown in grass[90] and can be naturalized there[200]. It also grows well amongst shrubs and by woodland edges[28]. Plant the corms about 7 - 10cm deep in July[1]. Plants seem to be immune to the predations of rabbits[233], though slugs may attack the corms[238]. The flowers are very attractive to bees and butterflies[201]. Special Features:Not North American native, Naturalizing, Suitable for cut flowers.

## 7.2.526 Asarum arifolium

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.2 m hkuc  
pchimhim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli xre7t hjonli

drutta Asarum arifolium is an evergreen Perennial growing to 0.2 m (0ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta EssentialAn essential oil obtained from the plant has the odour of sassafras[4].

dwatta StomachicThe root is stomachic[61].  
propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°c[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are hardy to at least -15°c[200]. The flowers are malodorous and are pollinated by flies[200]. The root has a pungent, aromatic smell like mild pepper and ginger mixed, but more strongly aromatic[245]. Plants often self-sow when growing in a suitable position[200].

## 7.2.527 Helleborus foetidus

Stinking Hellebore, Setterwort, Bear's Foot, Bearsfoot, Setterwort, Stinkwort, Stinking Hellebore

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.8 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikli-  
wisslip hpa7tmwatli xre7t hjonli

drutta Helleborus foetidus is an evergreen Perennial growing to 0.8 m (2ft 7in) by 0.3 m (1ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6 and is not frost tender. It is in flower from February to April, and the seeds ripen from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known  
tcanta A decoction of the roots is used as a parasiticide against body lice, fleas etc[76, 213]. This use is somewhat dangerous, see the notes above on toxicity.

diness. It is hardy to UK zone 7 and is not frost tender. It is in flower in June, and the seeds ripen from October to December. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta InsecticideThe leaves have insecticidal properties[218].

dwatta Anthelmintic Astringent Eczema Febrifuge Skin StomachicAnthelmintic, astringent, febrifuge, stomachic[61, 178]. The leaves are used in the treatment of abscesses, eczema and scabies[218]. The stem bark is anthelmintic and carminative[218].

propta Seed - best sown as soon as it is ripe in a cold frame[80, 113]. Pre-soak stored seed for 24 hours in warm water[80] then cold stratify for 2 - 3 months[98, 113]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer of the following year[240]. Cuttings of half-ripe wood, July/August in a frame[113]. Cuttings of mature shoots, November in a frame. Only use vigorous shoots[113]. Layering. Division of suckers in the dormant season[188].

nwatta Prefers a sunny position in a rich strong loam with abundant moisture at the roots[11, 200]. Succeeds in areas that do not experience prolonged winter temperatures below about -12°c[200], but young plants and the young shoots of older trees can be cut back by winter frosts[11]. Plants are tolerant of compacted soils[200]. The leaves are resinous to the touch and emit a resinous aroma[245]. The root system of this tree is too invasive for small gardens[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.477 Cunninghamia lanceolata

Chinese Fir

6 tlin 9 cyuc 0 kcaak 4 tcan 2 dwat 15 m hkuc  
htut cyutli tcup hwicli hrasjlutnyik hpa7tli frusflatprikwis  
hpa7tmwatli hjonli

drutta Cunninghamia lanceolata is an evergreen Tree growing to 15 m (49ft) by 6 m (19ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from January to May, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known at this time  
tcanta Charcoal Miscellany WoodAgroforestry Uses: The tree is suitable for reforestation schemes in subtropical evergreen, coniferous and mixed broad-leaved forests[ 303 , 329 ]. It is a suitable species for agroforestry systems in China as it is usually intercropped with a number of crops such as maize, beans, wheat, Chinese sorghum, buckwheat, potato, 'ground chestnut' (Arachis hypogaea), tobacco and upland rice; or with other tree species such as the tung oil tree (Aleurites fordii), tea and Litsea cubeba. The interplanting is important not only to increase the income of farmers during early stages of plantations but also to avoid the land degradation that results from continuous cropping of this tree[ 303 ]. Other Uses The bark is a source of tannins[ 303 ]. The branches produce an essential oil that is used in the perfume industry. Cedrol, pinene, phellandrene, citrene, terpinol, thujenol, cadinol and borneol are the main constituents of the oil[ 303 ]. The pale yellow to white, fragrant wood is uniform-textured; straight-grained; light in weight; and durable, though it rots easily if it is continually wet. It is easily worked and resists insect and termite damage. It is used in construction, ship building etc wherever great strength is required. Older and larger branches are used in turnery[ 1 , 46 , 61 , 178 , 303 ]. A good quality fuel and a charcoal can be made from the wood[ 178 , 303 ].

dwatta Antidote Carminative Miscellany SkinCarminative. A decoction of the wood is used internally in the treat-

ment of varnish poisoning (from species of Rhus), chronic ulcers, hernia etc[ 178 , 218 , 303 ]. The decoction of the wood is used as a bath for smelly feet[ 303 ]. An essential oil from the plant is used to treat bruises, pain, rheumatism and wounds[ 218 , 303 ]. The ash of the bark is used to treat burns, scalds and wounds[ 218 , 303 ]. A decoction of the cone is used in the treatment of coughs[ 218 , 303 ].

propta Seed - they have no dormancy and pre-treatment is not necessary. Germination can be improved by soaking the seeds in warm water for a few hours prior to sowing[ 325 ]. Seeds are sown in seed beds, germination begins after 7 days and is terminated after 20 days[ 325 ]. As soon as they are large enough to handle, the seedlings are pricked out into polytubes. Seedlings are normally ready for transplanting into the field in 4 - 5 months later, when they are 35 - 40cm tall[ 325 ]. Vegetative propagation of this species is relatively easy, and at one time most planting stock was produced from coppices from basal stumps after felling[ 325 ]. Nursery seedlings, however, have faster early growth and better survival than coppice sprouts. Since the 1980s, techniques have been developed to produce planting stock from root cuttings[ 325 ]. The cuttings are collected from the root collar when they reach a height of about 10 cm and placed in rooting beds. These cuttings have a survival rate of 90 - 95% and the quality is similar to that of seedling stocks[ 325 ]. Cuttings from lateral shoots are not suitable[ 325 ].

nwatta Landscape Uses:Pest tolerant, Specimen. A plant mainly of the warm temperate to subtropical zones, just entering into the tropics. It is found at elevations from near sea level to 2,600 metres[ 325 ]. It grows best in areas where the mean annual temperature is in the range 16 - 19°c and is fairly frost resistant - mature plants can tolerate temperatures down to about -15°c[ 418 ]. It prefers a mean annual rainfall in the range 900 - 2,350mm[ 325 ]. Requires a rich warm soil and a sheltered sunny position[ 1 , 164 ]. Best growth is obtained on well-drained loamy soils[ 325 ]. Prefers a pH in the range 5.5 - 6.5, tolerating 5 - 7.5[ 325 ]. Dislikes soil with free lime otherwise the pH is unimportant[ 200 ]. Young trees can make quite rapid growth in height, up to 60cm a year once they have attained more than 1 metre in height[ 185 ]. Before reaching the height of 1 metre, however, they are liable to be killed by frost[ 185 ]. Trees commence coning and producing viable seeds when they are around 6 - 8 years old[ 303 , 325 ]. This is the main re-forestation tree in China[ 46 , 61 ]. The most important fast-growing timber tree of the warm regions south of the Chang Jiang valley of China[ 266 ]. Unlike most conifers, this species can be coppiced, and it also resprouts from the roots if cut down[ 1 , 303 ]. The bruised foliage emits a delicious resinous aroma[ 245 ]. This species is notably resistant to honey fungus[ 200 ]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 7.2.478 Liquidambar formosana

Formosan Gum, Chinese Sweet Gum, Formosa Sweet Gum  
6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 12 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprik  
hpa7tmwatli hjonli

drutta Liquidambar formosana is a deciduous Tree growing to 12 m (39ft) by 10 m (32ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower in May, and the seeds ripen from October to November. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta Resin WoodAn aromatic resin is obtained from the trunk of this tree[4]. It forms in cavities of the bark and is harvested in autumn. It is used medicinally[178]. Wood. Used to make tea chests for higher grade teas[1, 46, 61].

dwatta Anodyne Antiphlogistic Antirheumatic Astringent Balsamic Cancer Haemostatic Odontalgic SkinThe leaves are used in the treatment of cancerous growths[218]. The stem is anodyne, antiphlogistic, astringent, balsamic and haemostatic[178, 218]. The resin from the stems is mixed with Rhamnus crenata fruits and used as a suppository for

constipation[218]. The stem bark is used in the treatment of fluxes and skin diseases[176]. The fruits are antirheumatic, diuretic and galactagogue[176]. They are used in the treatment of arthritis, lumbago, oedema, oliguria, decreased milk production and skin diseases[176, 218]. The root is used in the treatment of cancerous growths[218]. The resin from the stems is used to treat bleeding boils, carbuncles, toothache and tuberculosis[218].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame. Harvest the seed capsules at the end of October or November, dry in a warm place and extract the seed by shaking the capsule. Stored seed requires 1 - 3 months stratification and sometimes takes 2 years to germinate. Sow it as early in the year as possible. Germination rates are often poor. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame or greenhouse for their first winter. Since they resent root disturbance, it is best to plant them out into their permanent positions in early summer of their second year and give them some protection from cold for their first winter outdoors[K]. Cuttings of half-ripe wood, July/August in a frame. Suckers in early spring. Layering in October/November. Takes 12 months.

nwatta Landscape Uses:Aggressive surface roots possible, Specimen. Prefers a moist but not swampy loam in a sunny sheltered position[1, 200]. Succeeds in light shade[188]. Requires a deep fertile soil[200]. Prefers a neutral to acid soil, growing poorly on shallow soils overlying chalk[188]. Not all introductions of this species are hardy[11]. The Monticola group, which comes from western Hubei and north-eastern Sichuan, tolerates temperatures lower than -5°C[200, 260]. Young plants are susceptible to frost damage and should be protected for their first few years[200]. This species resents root disturbance, young plants should be pot-grown and be placed in their permanent positions as soon as possible[200]. Special Features:Attractive foliage, Not North American native, Inconspicuous flowers or blooms.

## 7.2.479 Schizophragma integrifolium

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 12 m hkuc pcmhmmihtut cyutli tcup hwicli hrasljutnyik hpa7tli flat-prikliwis hpa7tmwatli xre7t hjonli

drutta Schizophragma integrifolium is a deciduous Climber growing to 12 m (39ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta Plants can be allowed to sprawl and are then used as a ground cover for a shady position[208].

dwatta Carminative RefrigerantThe root and the climbing stem are carminative and refrigerant[147, 218]. Activates blood circulation, strengthens muscles and bones[147].

propta Seed - sow late winter to early spring in a greenhouse. Germination is usually fair to very good[78]. Prick out the seedlings into individual pots once they are large enough to handle and grow them on in light shade in the greenhouse for their first winter, planting them out in late spring or early summer. Layering in spring directly into pots. A fair to good percentage[78]. Cuttings of half-ripe wood, 4 - 5cm with a heel, July in a frame[1, 78]. Keep the cuttings moist[78].

nwatta Requires a moist leafy soil and some shade at the roots. An easily grown plant[1], it prefers a good loamy soil and plenty of moisture[11] but is not fussy[219]. Plants succeed in sun or shade[182], they flower better in a sunny position but will also succeed on a north-facing wall[188, 219]. In the hotter parts of Britain they prefer shade from the midday sun[219]. Tolerating temperatures down to about -10 to -15°C, this species is not reliably hardy in the coldest parts of the country[219]. Plants do not normally require pruning, though any unwanted growth can be removed in the winter[219]. Plants have a similar growth habit to ivy (*Hedera helix*) climbing trees by means of aerial roots or growing

along the woodland floor[1, 182]. Plants might need some help to become attached in their early years[182].

## 7.2.480 Cotoneaster frigidus

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 10 m hkuc pcmhmmihtut cyutli kyuctcup hwicli hyishrsajlutnyikfrip hpa7tli flatprikliwsslip hpa7tmwatli xre7t hjonli

drutta Cotoneaster frigidus is a deciduous Shrub growing to 10 m (32ft) by 10 m (32ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in June, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies, midges. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay and nutritionally poor soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil. It can tolerate atmospheric pollution.

kcaakta None known  
tcanta Basketry Dye Hedge HedgeA rose-tan dye is obtained from the fruit[168]. The branches are used in basketry and for making twig bridges in the Himalayas[145]. Can be grown as an informal hedge[200].

dwatta Blood tonicThe fruits are eaten to replenish the blood in cases of deficiency[272].

propta Seed. Members of this genus hybridize freely so, if you require seed that breeds true, it is important to obtain it from a known wild source or from a controlled fertilization of garden plants. The seed is best sown as soon as it is ripe in the autumn in a cold frame, when it will usually germinate in the spring[11, 200]. Stored seed germinates faster if given 3 months warm stratification at 15°C and then 3 months cold stratification at 4°C[164]. The seed usually germinates within 1 - 18 months at 15°C but it can take 2 years[164]. Pot the seedlings up as soon as they are large enough to handle and plant them out into nursery beds or into their permanent positions when they are more than 10cm tall. Cuttings of half-ripe wood with a heel, July/August in a frame[11, 200].

nwatta An easily grown plant, it prefers a good soil but also does well in poor soils[1, 11, 200]. It thrives in lime and is also happy in peaty soils[1]. It succeeds in any soil that is not marshy or waterlogged[11, 200]. Succeeds in dry soils[188]. Grows well in heavy clay soils. Succeeds in full sun or semi-shade but does not fruit so freely in a shady position[11, 200]. Plants also succeed in quite deep shade[219]. Tolerates atmospheric pollution[200]. A fast-growing plant[219]. The flowers, when inhaled near to, have an unpleasant smell like decaying fish[245]. They are very attractive to bees whilst the fruit is a good winter food source for many species of birds[200]. Hybridizes freely with other members of this genus, especially those species in the 'Salicifolia' group of this genus[182]. Trees are notably susceptible to honey fungus[200].

## 7.2.481 Ampelopsis japonica

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 10 m hkuc hmihmtut cyutli tcup hwicli jlut hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Ampelopsis japonica is a deciduous Climber growing to 10 m (32ft 10in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to August, and the seeds ripen from September to October. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects. Suitable for: medium (loamy) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Anodyne Antibacterial Antifungal Depurative Febrifuge VulneraryThe roots are anodyne, antibacterial, anticonvulsive, antifungal, bitter, cooling, depurative, expectorant, febrifuge and vulnerary[147, 176, 218]. A decoction of the roots is used in the treatment of tuberculous cervical nodes, bleeding from haemorrhoids and burn injuries[147].

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Antidote Febrifuge Haemostatic TonicThis plant is said to have medicinal properties, but no details were given in the report[145]. The flowers are used in Tibetan medicine, they are said to have a bitter taste and a cooling potency[241]. Antidote, febrifuge, haemostatic and tonic, they are used in the treatment of infectious fevers, influenza, nose bleeds, poisoning, sores from environmental poisoning and an inability to stretch or contract the limbs[241].

propta Seed - surface sow in spring in a cold frame. Do not allow the compost to become dry. Pre-chilling the seed for two weeks can improve germination rates[134]. Germination usually takes place within 2 weeks at 20°C[134]. When large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[200].

nwatta Succeeds in most good garden soils[1], preferring one that is well-drained and moisture retentive[200]. Prefers a sunny position[200]. A very ornamental plant[1], it grows well in a rock garden[1]. Most species in this genus seem to be immune to the predations of rabbits[233]. Hybridizes freely with other members of this genus[200].

## 7.2.522 Lycoris aurea

Golden Spider Lily  
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljut hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Lycoris aurea is a BULB growing to 0.6 m (2ft) by 0.1 m (0ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcaakta None known  
tcanta None known  
dwatta Cytotoxic PoulticeThe crushed bulb is used as a poultice for treating burns, scalds and ulcers[218]. The bulb contains lycorine, which is cytotoxic[218].

propta The seed is best sown as soon as it is ripe in a greenhouse and should germinate in the spring[200]. Sow the seed thinly so that it does not need to be disturbed for its first year of growth. Give an occasional liquid feed during the growing season to ensure the plants do not become nutrient deficient. Pot up the small bulbs when the plants become dormant, placing 2 bulbs in each pot. Grow them on for another 2 years in the greenhouse before planting them out when they are dormant. Division of offsets in the dormant season[200].

nwatta Requires a deep well-drained sandy soil rich in organic matter in full sun[200]. Plants require a dry period when they become dormant in the summer and they also dislike winter wet[218]. Hardy to at least -15°C[200]. Plants are attractive to slugs and need to be protected from them[200]. Very sensitive to root disturbance, the bulbs can take some years to become well established[200].

## 7.2.523 Paeonia obovata

6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 0.5 m hkuc hmihmtut cyutli tcup hwicli hrasljutnyikfrip hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Paeonia obovata is a PERENNIAL growing to 0.5 m (1ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known

dwatta Analgesic Antibacterial Antiinflammatory Antispasmodic Diuretic Febrifuge SedativeThe root is analgesic, antibacterial, anti-inflammatory, antispasmodic, diuretic, febrifuge and sedative[174]. The Chinese herb Chi Shao Yao is made from the whole root of a number of peony species, especially *P. lactiflora*, but also occasionally this species[250]. The most important ingredient medicinally in the root is paeoniflorin, which has been shown to have a strong antispasmodic effect on mammalian intestines, it also reduces blood pressure, reduces body temperature caused by fever and protects against stress ulcers[250]. A tea made from the dried crushed petals of various peony species has been used as a cough remedy, and as a treatment for haemorrhoids and varicose veins[250].

propta Seed - best sown as soon as it is ripe in a cold frame[250]. When sown fresh, the seed produces a root about 6 weeks after sowing with shoots formed in the spring[200]. Stored seed is much slower, it should be sown as soon as possible in a cold frame but may take 18 months or more to germinate[200]. The roots are very sensitive to disturbance, so many growers allow the seedlings to remain in their pots for 2 growing seasons before potting them up. This allows a better root system to develop that is more resilient to disturbance[250]. If following this practice, make sure you sow the seed thinly, and give regular liquid feeds in the growing season to ensure the plants are well fed. We usually prick out the seedlings into individual pots as soon as they are large enough to handle, and then grow them on in a cold frame for at least two growing seasons before planting them out when they are in growth in the spring[K]. Division with great care in spring or autumn. Each portion must have a leaf bud. If the lifted root is stood in shade for several hours it becomes less brittle and easier to divide[200]. Divisions that have several buds will usually flower in the second year, but those that only have one or two buds will take a number of years before they have grown sufficiently to flower[250].

nwatta Requires a deep rich soil, preferably neutral or slightly alkaline[1], doing quite well in sun or light shade[200]. Plants are tolerant of a wide range of soil conditions, but will not survive if the soil becomes waterlogged or is too dry[250]. This species is lime tolerant[200]. Plants grown on sandy soils tend to produce more leaves and less flowers, whilst those growing on clay take longer to become established but produce better blooms[250]. Dislikes cold winds[233]. Grows well in light woodland[233]. Plants are hardy to about -20°C[187]. A very long-lived plant, living for 50 years or more in the garden[200]. This species is closely related to *P. japonica*[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. Strongly resents root disturbance, taking some time to recover after being divided[1]. Peony species are usually self-fertile, though they will also hybridise with other species if these flower nearby at the same time[250]. Plants take 4 - 5 years to flower from seed[200]. They generally breed true from seed[1].

## 7.2.524 Anemone quinquefolia

Wind Flower, Wood anemone, Twoleaf anemone, Nightcups  
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.3 m hkuc pcmhmmihtut cyutli hgattcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli fyifxre7t hjonli

drutta Anemone quinquefolia is a PERENNIAL growing to 0.3 m (1ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil and can tolerate drought.

kcaakta None known  
tcanta None known  
dwatta Rubefacient VesicantEmployed as a rubefacient in the treatment of rheumatism, gout and fevers, it is also used as a vesicant in the removal of corns[207].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[1]. Surface sow or only just cover the seed and keep the soil moist. Sow stored seed as soon as

the top is then cut off obliquely about 5cm below the point where the stalks spring forth. The exuding juice is collected, which gradually hardens[4]. This resin is a drastic cathartic and hydrogogue and should be used with great caution[4, 46, 61]. The roots contain about 8% resin[240].

propta Seed - sow spring in a greenhouse[164]. Germination can be slow and erratic, a period of cold stratification might help reduce the germination period. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out in late spring or early summer, after the last expected frosts. Division in spring. Cuttings of young shoots, August in a frame in sand[1].

nwatta Prefers a light basic sharply drained soil of low to medium fertility[4, 200]. Prefers a sunny sheltered position. Thrives in dry soils[4] and succeeds in ordinary garden soils. The root can be up to 1.2 metres long, so for best results a deep soil is required[4].

## 7.2.518 Chaenactis douglasii

Morning Brides, Douglas' dustymaiden, Alpine dustymaiden 6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.4 m hkuc htut cyutli kyuctcup hwicli hyishras hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Chaenactis douglasii is a BIENNIAL/PERENNIAL growing to 0.4 m (1ft 4in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known

dwatta Cardiac Poultice StomachicMorning brides was employed medicinally by a number of native North American Indian tribes who used it to treat a variety of complaints, but especially to treat skin problems[257]. It is not generally used in modern herbalism. An infusion of the whole plant has been given to children in order to slow their heart rates[257]. It is also used in the treatment of stomach complaints, coughs and colds[257]. The fresh plant, or sometimes just the leaves, are crushed and applied as a poultice to swellings, sores and aches[207, 257]. An infusion is used as a wash for a variety of skin problems including pimples, chapped hands, boils and insect bites[257].

propta Seed - surface sow in spring in a greenhouse[207]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer.

nwatta Requires a deep well-drained gritty or gravelly soil, preferably of low fertility and a sunny position[207]. Grows well in the rock garden[207]. The plant is a biennial or short-lived perennial[207].

## 7.2.519 Goodyera pubescens

Downy Rattlesnake Plantain

6 tlin 10 cyuc 0 kcaak 0 tcan 2 dwat 0.4 m hkuc hmimhtut cyutli kyuctcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Goodyera pubescens is an evergreen Perennial growing to 0.4 m (1ft 4in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 6. It is in leaf all year, in flower from July to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers dry or moist soil.

kcakta None known  
tcanta MiscellanyNone known

dwatta Appetizer Miscellany Odontalgic Ophthalmic PoulticeA tea made from the roots is used in the treatment of pleurisy and snakebites[222]. A tea made from the leaves is taken to improve the appetite, as a treatment for colds,

kidney ailments, rheumatism and toothaches[222, 257]. Externally, a poultice of the wilted leaves is used to cool burns, treat skin ulcers and relieve rheumatic joints[222, 257]. An ooze from the plant (this probably means the sap or the juice of the bulb[K]) has been used as eye drops to treat sore eyes[257].

propta Seed - surface sow, preferably as soon as it is ripe, in the greenhouse and do not allow the compost to dry out. The seed of this species is extremely simple, it has a minute embryo surrounded by a single layer of protective cells. It contains very little food reserves and depends upon a symbiotic relationship with a species of soil-dwelling fungus. The fungal hyphae invade the seed and enter the cells of the embryo. The orchid soon begins to digest the fungal tissue and this acts as a food supply for the plant until it is able to obtain nutrients from decaying material in the soil[200]. It is best to use some of the soil that is growing around established plants in order to introduce the fungus, or to sow the seed around a plant of the same species and allow the seedlings to grow on until they are large enough to move.

nwatta Landscape Uses:Border, Ground cover, Massing. Requires a somewhat shady site and a well-drained compost of peat, leafmold and sand[1]. Does well in the woodland garden[42, 230]. Orchids are, in general, shallow-rooting plants of well-drained low-fertility soils. Their symbiotic relationship with a fungus in the soil allows them to obtain sufficient nutrients and be able to compete successfully with other plants. They are very sensitive to the addition of fertilizers or fungicides since these can harm the symbiotic fungus and thus kill the orchid[230]. This species is closely related to the British native species, *G. repens*[230]. This plant is too rare in the wild to be harvested[222]. Special Features:Attractive foliage, North American native, Attractive flowers or blooms.

## 7.2.520 Clinopodium umbrosum

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 0.6 m hkuc hmimhtut cyutli tcup hwicli hrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Clinopodium umbrosum is a PERENNIAL growing to 0.6 m (2ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta EssentialYields an essential oil[145]. No more details are given.

dwatta VulneraryThe juice of the leaves is applied to cuts and wounds[272].

propta Seed - sow spring in a cold frame. Only just cover the seed. Germination usually takes place within 2 weeks at 21 °c. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse. Plant them out in the summer if they have made sufficient growth, otherwise plant them out in late spring or early summer of the following year. Division in spring. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the summer or following spring. Cuttings of soft wood in May or June.

nwatta Succeeds in almost any well-drained soil[1].

## 7.2.521 Aster diplostephioides

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 0.5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta Aster diplostephioides is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, beetles, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

propta Seed - sow in pots in a cold frame in the autumn or stratify for 6 weeks at 5 °c and sow in the spring[200]. Germination can be quite slow, sometimes taking more than a year. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. When they are more than 20cm tall, they can be planted out into their permanent positions, preferably in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, 7 - 10cm long, July/August in a frame[78]. Cuttings or eyes in late autumn or winter. Either place them in the ground in a greenhouse or cold frame, or put them in pots. An eye cutting is where you have just one bud at the top and a short length of stem with a small part of the bark removed. These normally root well and grow away vigorously, being ready to plant into their permanent positions the following autumn. Layering into pots in late summer. Partially sever the stem in spring and then lift the new plants in the autumn[78].

nwatta Prefers a deep rich loam in a warm sheltered position in sun or semi-shade[11, 200]. Requires plenty of root room[11]. The young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. Plants rarely produce fruit in Britain except after a long hot summer[200]. Plants are occasionally cultivated in Japan for medicinal purposes[58]. The shoots have sticky pads and are self-supporting on walls[11]. Another report says that plants climb by means of coiling tendrils but large plants often need tying in to support the weight of foliage[200].

## 7.2.482 Campsis grandiflora

Trumpet Creeper

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 9 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Campsis grandiflora is a deciduous Climber growing to 9 m (29ft 6in) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in leaf from June to October, in flower from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta Plants can be allowed to scramble on the ground and will form an effective ground cover, rooting at intervals along the branches[208]. They should be planted about 2.5 metres apart each way[208].

dwatta Blood tonic Carminative Diuretic Febrifuge Women's complaintsThe flowers and the whole plant are blood tonic, carminative, depurative diuretic and febrifuge[147, 178, 218]. They are used in the treatment of women's complaints[147, 178]. A decoction of the flowers is used to correct menstrual disorders, rheumatoid pains, traumatic injuries, difficult urination, pruritis and oozing dermatoses[147, 218].

propta Seed - sow spring in a greenhouse at 10 °c. Two months stratification at 5 °c assists germination[200]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of almost ripe wood, 7 - 10cm long, July/August in a frame. Slow to root but a fair percentage[78, 200]. Root cuttings 5cm long in December. Fair to good percentage[78]. Division of suckers in the dormant season[202]. Layering in winter[188]. Plants often self-layer[260].

nwatta Succeeds in a good well-drained loam[11, 200] and a very sunny position[166] or light shade[200]. Tolerates moderately alkaline or moderately acid soils[202]. Dormant plants are hardy to about -10 °c[200], though they require a sunny sheltered wall or hot summers if they are to flower well[11, 166]. The fresh young growth in spring is often damaged by late frosts[208]. Plants can take some years to settle down before they start to flower[202]. They climb by means of aerial roots but need to be supported[11, 166]. Another report says that this species does not produce aerial roots[219]. Plants can be pruned like grapes (*Vitis* spp.)[11]

and any pruning is best done in the spring[188]. The subspecies *C. grandiflora thunbergii* tolerates saline winds[200]. Hybridizes freely with other members of this genus[200].

## 7.2.483 Photinia serratifolia

Taiwanese photinia , Chinese Photinia

6 tlin 10 cyuc 0 kcaak 0 tcan 1 dwat 8 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Photinia serratifolia is an evergreen Shrub growing to 8 m (26ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in April, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta WoodThe wood is hard and heavy, suitable for making furniture and other small articles[266].

dwatta Anodyne Aphrodisiac Diuretic Febrifuge Stimulant TonicThe leaves are diuretic, febrifuge, stimulant and tonic[218]. A tincture of the wood is ingested as a tonic and anodyne[218]. The plant is said to have excessive aphrodisiac properties[218].

propta Seed - best sown in a cold frame as soon as it is ripe in the autumn. Stored seed will probably require stratification and should be sown as early in the year as possible[78]. Germination is usually good[78]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Basal cuttings in a frame[200]. Harvest the shoots with plenty of underground stem when they are about 8 - 10cm above the ground. Pot them up into individual pots and keep them in light shade in a cold frame or greenhouse until they are rooting well. Plant them out in the summer. Cuttings of half-ripe wood, 7 - 10cm with a heel, July/August in a frame[11, 78]. They take about 2 months to root and should be overwintered in a greenhouse, planting out in late spring[78]. Fair to good percentage[78]. Cuttings of almost ripe side shoots, 7 - 12cm with a heel, October/November in a cold frame[78]. Lift the following autumn and plant in their permanent positions[78]. Layering in autumn. Partially sever the layer about 12 months later and lift in the following spring. High percentage[200].

nwatta Landscape Uses:Pest tolerant, Screen, Standard, Specimen, Street tree. Requires a well-drained fertile soil in a sheltered position in sun or light shade[1, 200]. Prefers a warm soil that is not too heavy or close[11]. Tolerates calcareous soils[11, 200]. Dislikes windy sites[11]. Plants are hardy to between -7 and -12 °c[200]. Hardy at Kew Gardens in all but exceptionally cold winters, this species is at its best in the milder areas of the country where specimens up to 15 metres tall exist[11]. There are some named forms, selected for their ornamental value[200]. The flowers have a delicate scent[245]. Plants are susceptible to fireblight[200]. Plants in this genus are notably resistant to honey fungus[200]. Special Features:Attractive foliage, Not North American native, Blooms are very showy.

## 7.2.484 Eucalyptus pauciflora niphophila

Snow Gum

6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 6 m hkuc htut cyutli hgatkyuctcuphja7n hwicli hyishrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta Eucalyptus pauciflora niphophila is an evergreen Tree growing to 6 m (19ft) by 3.5 m (11ft) at a fast rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils,

prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry moist or wet soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.

kcakta None known

tcanta Essential Fuel ShelterbeltThe leaves yield between 0.7 and 0.8% essential oil. It is a good antiseptic[154]. Fairly tolerant of maritime exposure, it can be grown as part of a shelterbelt in maritime areas[75]. Wood is a good source of fuel[154].

dwatta AntisepticEucalyptus leaves are a traditional Aboriginal herbal remedy. The essential oil found in the leaves is a powerful antiseptic and is used all over the world for relieving coughs and colds, sore throats and other infections[254]. The essential oil is a common ingredient in many over-the-counter cold remedies[254]. An essential oil obtained from the leaves is antiseptic[154]. The essential oil from various species of eucalyptus is a very powerful antiseptic, especially when it is old, because ozone is formed in it on exposure to air. It has a decided disinfectant action, destroying the lower forms of life[4]. The oil can be used externally, applied to cuts, skin infections etc, it can also be inhaled for treating blocked nasal passages, it can be gargled for sore throat and can also be taken internally for a wide range of complaints[4]. Some caution is advised, however, because like all essential oils, it can have a deleterious effect on the body in larger doses[4].

propta Seed - surface sow February/March in a sunny position in a greenhouse[11, 78, 134]. Species that come from high altitudes appreciate 6 - 8 weeks cold stratification at 2°C[200]. Pot up the seedlings into individual pots as soon as the second set of seed leaves has developed, if left longer than this they might not move well. Plant out into their permanent positions in early summer and give them some protection from the cold in their first winter. The seed can also be sown in June, the young trees being planted in their final positions in late spring of the following year. The seed has a long viability[200].

nwatta Prefers a sunny position in a moderately fertile well-drained moisture retentive circum-neutral soil[200]. Succeeds in most soils but dislikes chalk or clay soils[98]. Tolerates poor soils, especially those low in mineral elements[200]. Tolerant of drought, dry soils[200] and exposed positions[75]. This is perhaps the hardiest species in this genus, it tolerates long periods down to -14°C and short periods as low as -20°C[107, 200]. Eucalyptus species have not adopted a deciduous habit and continue to grow until it is too cold for them to do so. This makes them more susceptible to damage from sudden cold snaps. If temperature fluctuations are more gradual, as in a woodland for example, the plants have the opportunity to stop growing and become dormant, thus making them more cold resistant. A deep mulch around the roots to prevent the soil from freezing also helps the trees to survive cold conditions. The members of this genus are remarkably adaptable however, there can be a dramatic increase in the hardiness of subsequent generations from the seed of survivors growing in temperate zones[200]. Eucalyptus monocultures are an environmental disaster; they are voracious, allelopathic and encourage the worst possible attitudes to land use and conservation[200]. A very ornamental tree[1], it grows very slowly in its first 2 or 3 years but is then capable of growing 1 metre or more a year[11]. Plants self-sow in Devon[1]. Plants are shallow-rooting and, especially in windy areas, should be planted out into their permanent positions when small to ensure that they do not suffer from wind-rock[245]. They strongly resent root disturbance and should be container grown before planting out into their permanent position[11]. In Australia this species usually regenerates from the base after forest fires[167]. The flowers are rich in nectar and are a good bee crop[200].

## 7.2.485 Buddleia globosa

Orange Ball Tree

6 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 5 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli hjonli

drutta Buddleia globosa is an evergreen Shrub growing to 5 m (16ft) by 5 m (16ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from June

to July. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure.

kcakta None known

tcanta MiscellanyNone known

dwatta MiscellanyOne report says that it is cultivated as a medicinal plant in S. America but gives no more details[184].

propta Seed - cold stratify for 4 weeks at 4°C[138] and surface sow the seed in February/March in a greenhouse[78, 113]. Germination usually takes place within 3 - 4 weeks at 21°C[138]. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter, planting them out into their permanent positions in late spring or early summer, after the last expected frosts. Seedlings are inclined to damp off and so should be watered with care and kept well-ventilated[78]. Cuttings of half-ripe wood, July/August in a frame[11, 113]. Use short side-shoots[78]. Very high percentage[113]. Cuttings of mature wood of the current season's growth, 15 - 20cm long, October/November in a frame[200].

nwatta Requires a sunny position[11, 182]. Prefers a rich loamy well-drained soil[11, 200]. Very tolerant of alkaline soils[200]. Grows well by the sea, tolerating maritime exposure[184, 200]. Plants are hardy to about -15°C if they are sheltered from cold winds[184, 200]. They respout freely from the base if cut back by cold weather[200] and are deciduous in cold winters[188]. Plants flower on the previous year's growth[200]. The flowers scent the air for a considerable distance with their sweet honey-like fragrance[245].

## 7.2.486 Rhododendron ponticum

Rhododendron

6 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 5 m hkuc hmim cyutli tcup hwicli hrasljut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta Rhododendron ponticum is an evergreen Shrub growing to 5 m (16ft 5in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta Hedge HedgePlants are being grown as a hedge at the RHS gardens in Wisley, Surrey[29]. It tolerates quite hard clipping[200].

dwatta Antirheumatic CardiacA medicine made from the plant is used to treat heart and circulation malfunctions, but it should not be used without expert supervision[9].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. A pH between 4.5 and 5.5 is ideal[1]. Succeeds in sun or shade, the warmer the climate the more shade a plant requires[184, 200]. Hardy to about -15°C[184]. Plants are self-sowing aggressively in British woodlands and are often out-competing native trees by filling the understorey and preventing natural regeneration. They are considered to be a pernicious weed by many environmentalists. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with

well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Hedge Hedge WoodPlants are sometimes grown as a hedge[146]. Wood - close grained, moderately hard[146].

dwatta Aromatic StimulantThe seeds are aromatic and stimulant[240].

propta Seed - sow spring in a greenhouse and only just cover the seed. Germination usually takes place within 1 - 3 months at 10°C. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10 - 12 cm with a heel, July/August in a frame. Plant out in the following spring[200]. Cuttings of mature wood, 12 - 17cm with a heel, October/November in a sheltered position outdoors. Plants root by the spring. Good percentage[78].

nwatta Landscape Uses:Container, Ground cover, Massing, Rock garden. Easily grown in any reasonably good well-drained but moisture retentive soil[1]. Succeeds in sun or semi-shade but flowers better in a sunny position[200]. This species is only hardy to about -5°C but plants can respout from the base if they are cut back by cold[184]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Attractive foliage, Not North American native, Attractive flowers or blooms.

## 7.2.514 Nicotiana glauca

Tobacco, Jasmine tobacco, Nicotiana, Jasmine Tobacco, Ornamental Tobacco, Flowering Tobacco  
6 tlin 9 cyuc 0 kcak 3 tcan 0 dwat 0.6 m hkuc htut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Nicotiana glauca is a PERENNIAL growing to 0.6 m (2ft) by 0.3 m (1ft in) at a slow rate. See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). It is noted for attracting wildlife. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta InsecticideAll parts of the plant contain nicotine, this has been extracted and used as an insecticide. Landscape Uses: Border, Container, Massing, Specimen. Dynamic accumulator.

dwatta None known

propta Seed - surface sow in a warm greenhouse about 10 weeks before the last expected spring frosts. The seed usually germinates in 10 - 20 days at 20°C. Keep the soil moist and pot up as soon as the plants are big enough to handle, planting them out after the last expected frosts.

nwatta Prefers a well-drained deep rich moist soil in a sunny position[1, 108]. Hardy to about -5°C[200], this plant is usually grown as an annual in Britain, flowering well in its first year, but it does survive mild winters outdoors[1]. A very ornamental plant[1], it has sweetly scented flowers that release most of their scent in the evening and attract moths[30]. Plant requires more than 14 hours daylight per day to induce flowering[169]. Special Features:Attracts birds, Not North American native, Naturalizing, All or parts of this plant are poisonous, Attracts butterflies, Suitable for cut flowers, Fragrant flowers, Attractive flowers or blooms.

## 7.2.515 Clinopodium glabellum

Glade calamint

6 tlin 7 cyuc 0 kcak 3 tcan 0 dwat 0.6 m hkuc hmimhtut cyutli tcuphja7n hwicli hrasljutnyik hpa7tli flat hpa7tmwatli hjonli

drutta Clinopodium glabellum is an evergreen Perennial growing to 0.6 m (2ft) by 1.5 m (5ft in) at a fast rate. See

above for USDA hardiness. It is hardy to UK zone 7. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist or wet soil.

kcakta None known

tcanta Bog gardens. A good fast growing, medium density ground cover. Can withstand some foot-traffic. An aromatic pest confuser that may confuse pests reducing their ability to find and eat crops [1-2].

dwatta None known

propta Seed

nwatta An herbaceous perennial with showy flowers. Flower Color:Lavender. Bloom Size: 1"-2". Suitable Locations: Bog gardening. For polyculture design as well as the above-ground architecture (form - tree, shrub etc. and size shown above) information on the habit and root pattern is also useful and given here if available. The plant growth habit is a clumper with limited spread [1-2]. An evergreen. The root pattern is fibrous dividing into a large number of fine roots [1-2].

## 7.2.516 Coptis japonica

6 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.2 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flat hpa7tmwatli xre7t hjonli

drutta Coptis japonica is an evergreen Perennial growing to 0.2 m (0ft 8in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower in May. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta Can be grown as a ground cover plant in the peat garden[200].

dwatta Antibacterial Antiinflammatory Dysentery StomachicThe root is a pungent, very bitter, cooling herb that controls bacterial and viral infections, relaxes spasms, lowers fevers and stimulates the circulation[238]. It is locally analgesic and anaesthetic[238] and is also anti-inflammatory and stomachic. It is used in the treatment of intestinal catarrh[4, 61, 174], dysentery, enteritis, high fevers, inflamed mouth and tongue, conjunctivitis etc[238]. The root is harvested in the autumn and can be used fresh or dried[238].

propta Seed - best sown in a greenhouse as soon as it is ripe in an ericaceous compost[164]. Seal the pot in a polythene bag until germination takes place, which is usually within 1 - 6 months at 10°C[164]. Stored seed should be sown as early in the year as possible. Four weeks cold stratification may be beneficial[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow on in a shady part of the greenhouse for at least their first winter. Plant them out in mid-autumn or in spring. Division in spring[200].

nwatta Requires a light moist humus-rich slightly acidic soil with a northerly aspect or light shade[1, 200].

## 7.2.517 Convolvulus scammonia

Scammony

6 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 0.8 m hkuc htut cyutli kyuctcup hwicli hyishrasljut hpa7tli prikliwis hpa7tmwatli fyifxre7t hjonli

drutta Convolvulus scammonia is a PERENNIAL growing to 0.8 m (2ft 7in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in July, and the seeds ripen in September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known

tcanta None known

dwatta Cathartic HydrogogueA resin is obtained from the root. The earth is cleared away from the top of the root,

excellent remedy for a weak stomach, especially when this gives rise to nausea, indigestion and bloating, and it has also been shown to protect the liver[254]. It is perhaps best known in India as the main ingredient in mahasudarshana churna, a remedy containing more than 50 herbs[254]. The plant has an interesting chemistry, similar in many respects to *Gentiana lutea*, a widely used restorative tonic of the digestive system[238]. It also contains xanthones, which are reputedly effective against malaria and tuberculosis, and also amarogentin, a glycoside that may protect the liver against carbon tetrachloride poisoning[238]. The whole plant is an extremely bitter tonic digestive herb that lowers fevers and is stimulant[165, 238]. The herb has a beneficial effect on the liver, promoting the flow of bile, it also cures constipation and is useful for treating dyspepsia[4, 238]. The plant is harvested when the seed is setting and then dried for later use[4].

propta Seed - sow spring in temperatures not exceeding 10°C in a humus-rich medium[200]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in early summer.

nwatta Succeeds in a moist humus-rich soil in damp light woodlands, streambeds or the bog garden[200]. Grows best in areas with cool summers[200]. Succeeds in full sun or partial shade[238]. Plants are hardy to at least -15°C[238].

## 7.2.511 Delphinium denudatum

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Delphinium denudatum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 7. It is in flower from July to August. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta ParasiticideA parasiticide is obtained from the leaves[172]. It is quite toxic and so is for external use only.  
dwatta Alternative Bitter Odontalgic Parasiticide Stimulant TonicThe roots are alterative, bitter, stimulant and tonic[240]. A paste of the rot is used in the treatment of toothache, and also as an adulterant for aconite (from *Aconitum* spp.)[240, 272].

propta Seed - sow March/April in a cold frame or May outdoors[111]. Keep moist and in a shady position until germination takes place[175]. The seed has a limited viability so it should be stored in a sealed container at about 3°C[200]. Temperatures above 15°C inhibit germination[175]. The seed usually germinates in 2 - 9 weeks at 15°C[175]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. Cuttings of basal shoots in April/May, taken before they become hollow at the base, and planted in a cold frame[111]. Division in spring[111] or early autumn[200].

nwatta Succeeds in most soils so long as they are rich and well-drained[200]. Intolerant of winter-wet soils[200]. Requires an open sunny position[188]. This plant is adored by slugs[175]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.512 Datura stramonium

Thorn Apple, Jimsonweed, Jamestown Weed  
6 tlin 9 cyuc 0 kcaak 1 tcan 4 dwat 1.5 m hkuc htut cyutli kyuctcup hwicli hrasljut hpa7tli prikliw hpa7tmwatli xre7t hjonli

drutta *Datura stramonium* is an ANNUAL growing to 1.5 m (5ft) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to October, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Moths. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta Hair RepellentThe growing plant is said to protect neighbouring plants from insects[18, 20]. The juice of the fruits is applied to the scalp to cure dandruff and falling hair[243]. There has also been considerable interest in the use of extracts of *Datura* species as botanical pesticides. D. metel, for example, appears to suppress a number of nematode species of economic importance. Landscape Uses: Border, Container, Foundation, Specimen.

dwatta Anodyne Anthelmintic Antiasthmatic Antidandruff Antiinflammatory Antispasmodic Hallucinogenic Hypnotic Mydriatic NarcoticThe thornapple is a bitter narcotic plant that relieves pain and encourages healing[238]. It has a long history of use as a herbal medicine, though it is very poisonous and should be used with extreme caution. The leaves, flowering tops and seeds are anodyne, antiasthmatic, antispasmodic, hallucinogenic, hypnotic, mydriatic and narcotic[1, 4, 7, 9, 13, 21, 46, 165, 238, 240]. The seeds are the most active medicinally[4]. The plant is used internally in the treatment of asthma and Parkinson's disease, excess causes giddiness, dry mouth, hallucinations and coma[238]. Externally, it is used as a poultice or wash in the treatment of fistulas, abscesses wounds and severe neuralgia[238, 257]. The use of this plant is subject to legal restrictions in some countries[238]. It should be used with extreme caution and only under the supervision of a qualified practitioner since all parts of the plant are very poisonous and the difference between a medicinal dose and a toxic dose is very small[21, 213, 238]. The leaves should be harvested when the plant is in full flower, they are then dried for later use[4]. The leaves can be used as a very powerful mind-altering drug, they contain hyoscyamine and atropine[213]. There are also traces of scopolamine, a potent cholinergic-blocking hallucinogen, which has been used to calm schizoid patients[213]. Atropine dilates the pupils and is used in eye surgery[222]. The leaves have been smoked as an antispasmodic in the treatment for asthma, though this practice is extremely dangerous[213, 222]. The seeds are used in Tibetan medicine, they are said to have a bitter and acrid taste with a cooling and very poisonous potency[241]. Analgesic, anthelmintic and anti-inflammatory, they are used in the treatment of stomach and intestinal pain due to worm infestation, toothache and fever from inflammations[241]. The juice of the fruit is applied to the scalp to treat dandruff[243].

propta Sow the seed in individual pots in early spring in a greenhouse[200]. Put 3 or 4 seeds in each pot and thin if necessary to the best plant. The seed usually germinates in 3 - 6 weeks at 15°C. Plant out in late spring or early summer, after the last expected frosts. Especially in areas with hot summers, it is worthwhile trying a sowing outdoors in situ in mid to late spring.

nwatta Landscape Uses: Border, Container, Foundation, Specimen. Succeeds in most moderately good soils but prefers a rich light sandy soil or a calcareous loam, and an open sunny position[1, 4, 200]. Plants often self-sow when well sited[1]. The thornapple is cultivated commercially as a medicinal plant[57]. It can become a weed in suitable conditions and is subject to statutory control in some countries[238]. This species is extremely susceptible to the various viruses that afflict the potato family (Solanaceae), it can act as a centre of infection so should not be grown near potatoes or tomatoes[200]. Grows well with pumpkins[20]. The whole plant gives off a nauseating stench[245]. Special Features: North American native, Naturalizing, All or parts of this plant are poisonous, Fragrant flowers, Attractive flowers or blooms.

## 7.2.513 Hypericum patulum

Goldencup St. Johnswort  
6 tlin 7 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli fyifxre7t hjonli

drutta *Hypericum patulum* is an evergreen Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in leaf all year, in flower from August to October, and the seeds ripen from September to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers

ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. Plants in this genus are notably susceptible to honey fungus[200].

## 7.2.487 Hebe salicifolia

6 tlin 9 cyuc 0 kcaak 3 tcan 1 dwat 4.5 m hkuc htut cyutli tcup hwicli hyihrasljut hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Hebe salicifolia* is an evergreen Shrub growing to 4.5 m (14ft) by 3 m (9ft). See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year, in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Hedge HedgeA very wind resistant shrub, it can be grown as a shelter hedge in exposed maritime positions. Attractive flowers.

dwatta Antispasmodic DysenteryTreats dysentery, having an antiperistaltic action[153].

propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse in spring. Only just cover the seed and do not allow the compost to dry out. Prick out the seedlings into individual pots when they are large enough to handle. Grow on the young plants for at least their first winter in a greenhouse and plant out in late spring or early summer after the last expected frosts. It would probably be worthwhile giving some protection to the plant for its first winter outdoors. Cuttings of half ripe wood, 3 - 5cm with a heel, July/August in a frame. Pot up when roots are forming and keep in a frame or greenhouse for its first winter before planting out in late spring. Cuttings of mature wood, late autumn or winter in a frame.

nwatta Succeeds in most soils so long as they are not boggy or too dry[182]. Prefers a light well-drained soil[1, 166] and a sunny position[200]. Prefers a moist rich soil[166] but plants are probably harder in a soil that is on the poor side[1]. Lime tolerant[11]. Intolerant of drought[166]. Tolerates atmospheric pollution[200]. Very wind resistant, withstanding maritime exposure[166]. A polymorphic species[200], it hybridizes freely with other members of this genus. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 7.2.488 Tamarix chinensis

Chinese Tamarisk, Five-stamen tamarisk  
6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat 4.5 m hkuc htut cyutli kyuctcup hwicli hrasljutnyik hpa7tli flatprikliw hpa7tmwatli xre7t hjonli

drutta *Tamarix chinensis* is a deciduous Shrub growing to 4.5 m (14ft 9in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 7. It is in flower from July to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline and saline soils. It cannot grow in the shade. It prefers dry or moist soil. The plant can tolerate maritime exposure.

kcakta None known  
tcanta Hedge HedgeVery tolerant of maritime exposure, it makes a good shelter hedge in coastal gardens.

dwatta Analgesic Antivinous Carminative Depurative Diuretic Febrifuge VulneryThe leaves are analgesic, antipyretic, antivinous, carminative, depurative, diuretic, febrifuge[147, 218]. Aids measles rash surfacing[147]. The wood is used in the treatment of anthrax-like sores[218] A manna from the plant is vulnerary[18].

propta Seed - sow spring in a cold frame and only just cover the seed. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy[200]. Cuttings of mature wood of the current seasons growth, 15 - 25cm long, planted outdoors in late autumn in a nursery bed or straight into their permanent position. High percentage[11, 200].

nwatta An easily grown plant, succeeding in most soils and tolerant of saline conditions[11]. Grows well in heavy clay soils as well as in sands and even shingle[182]. Usually found near the coast, it succeeds inland if given a fairly good deep loam and a sunny position[11, 200]. Tolerant of maritime winds and dry soils when grown near the coast[11], plants require a moister soil and shelter from cold drying winds when they are grown inland in non-saline soils because they use the soil salts that are found in saline soils to help them reduce transpiration[200]. This species flowers on the current year's growth[227]. Any pruning is best carried out in spring, hedges are also best trimmed at this time[188]. Plants are tolerant of severe pruning, sprouting freely from old wood[K]. Very closely related to *T. ramosissima*[11]. This plant is often mis-identified as *T. gallica*[50] or *T. indica*[200]. Plants in this genus are notably resistant to honey fungus[200].

## 7.2.489 Jasminum nudiflorum

Winter-Flowering Jasmin, Winter jasmine  
6 tlin 11 cyuc 0 kcaak 0 tcan 1 dwat 3.6 m hkuc pcmhimmhut cyutli tcup hwicli hrasljutnyik hpa7tli frusflatprikliw hpa7tmwatli xre7t hjonli

drutta *Jasminum nudiflorum* is a deciduous Shrub growing to 3.6 m (11ft) by 4.5 m (14ft) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower from December to March. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very acid and very alkaline soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Soil stabilizationA good soil stabilizer for steep banks, succeeding in shady positions[200]. The sprawling branches make this a good plant for ground cover, the plants should be spaced about 1.8 metres apart each way[208].

dwatta DiaphoreticDiaphoretic[178].  
propta Seed - best sown as soon as it is ripe in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame. Very easy. Cuttings of mature wood in November. Layering.

nwatta Landscape Uses:Arbor, Cascades, Erosion control, Foundation, Ground cover, Massing, Screen, Standard. Succeeds in a good well-drained loam[1]. Grows well in heavy clay soils. Prefers a good soil and a sunny position but succeeds in shade[11, 28, 49], including on a north facing wall[200]. Tolerates very poor soils, whether acid or alkaline[202]. Tolerates urban pollution[200]. A very ornamental plant[1], it is hardy to about -15°C[184]. Some winter die-back can be experienced and flowers can be damaged in severe winters but new flowers are usually produced when the weather warms up[202]. A winter-flowering plant, flowering mainly on wood that was produced the previous summer[219]. Pruning can be carried out in early to mid spring once flowering has finished[202, 219]. Removing one third of the oldest growth down to ground level rejuvenates the plant

and encourages greater flowering[202]. Unpruned plants tend to become woody and matted with dead stems[219]. The flowers have a delicate mossy perfume[245]. This species does not set seed in British gardens. This might be because all the plants in cultivation stem from one original importation[182]. An ideal plant for growing on shady walls and banks[28, 49]. Plants in this genus are notably resistant to honey fungus[200]. Special Features: Not North American native, Attractive flowers or blooms.

## 7.2.490 Clematis mandschurica

6 tlin 9 cyuc 0 kcaak 0 tcan 2 dwat m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Clematis mandschurica is a PERENNIAL growing to 1.2 m (4ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to August. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcaakta None known  
tcanta None known

dwatta Analgesic Antibacterial Antifungal Dysentery Emmenagogue HypotensiveThe root is analgesic, antibacterial, antidiuretic, antifungal, emmenagogue and hypotensive[279]. It contains several medically active constituents including clematosides, hederagenin and anemonin[279]. It is used in Korea in the treatment of leucorrhoea, dysentery, neuralgia, menostasis and delayed menstruation[279].

propta Seed - best sown as soon as it is ripe in a cold frame[164, 200]. Sow stored seed as soon as it is obtained in a cold frame. Pre-soak the seed for 12 hours in warm water and remove as much of the tail and outer coat as possible[164]. A period of cold stratification is beneficial[164]. The seed germinates in 1 - 9 months or more at 20°C[164]. Prick out the seedlings into individual pots when they are large enough to handle and grow them on in a cold frame for their first winter. Plant out in late spring or early summer, after the last expected frosts. Internodal cuttings of soft to semi-ripe wood, late spring in sandy soil in a frame[200]. Layering of old stems in late winter or early spring[200]. Layering of current seasons growth in early summer[200].

nwatta Prefers a deep moist soil with its roots in the shade[11, 200]. Dislikes poorly-drained heavy clay soils, but grows well in clay if grit is added for drainage[11, 200]. Dislikes light sandy soils[11]. Does well on chalk[11]. Succeeds in acid as well as alkaline soils[200]. This species is closely related to *C. terniflora*, and is included in that species by some botanists[273]. When planting out, in order to avoid the disease 'clematis wilt', it is best to plant the rootball about 8cm deeper in the soil. This will also serve to build up a good root crown of growth buds[200]. The plant flowers on the current season's growth, so any pruning is best carried out in late winter or early spring[273]. A twining plant[182]. The leaf stalks wrap themselves around twigs and branches for support. When a side of the stalk touches an object, the growth on that side slows down whilst the other side grows at its normal rate - this causes the leaf stalk to entwine the object it is touching[212]. Plants seem to be immune to the predations of rabbits[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54].

## 7.2.491 Centaurea melitensis

Maltese Star Thistle

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat m hkuc htut cyutli hgatyuctcup hwicli hyhisrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxtre7t hjonli

drutta Centaurea melitensis is a ANNUAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies, Lepidoptera (Moths and Butterflies). The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and

can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known  
tcanta None known

dwatta The plant is used in the treatment of the kidneys[257].

propta Seed - sow April in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out into their permanent positions in the summer. If you have sufficient seed it can be sown in situ in the spring, and an autumn swing in situ might also be worth trying.

nwatta We do not have information on this species, but the following notes are based on the closely related *C. solstitialis*. Succeeds in ordinary garden soil[1, 200]. Prefers a well-drained fertile soil and a sunny position[200]. Tolerates dry, low fertility and alkaline soils[200]. A good bee and butterfly plant the flowers are rich in nectar[171]. Members of this genus are rarely if ever troubled by browsing deer[233].

## 7.2.492 Asarum maximum

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat m hkuc pcmhmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Asarum maximum is a PERENNIAL growing to 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to June. The species is hermaphrodite (has both male and female organs) and is pollinated by Flies. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers moist soil.

kcaakta None known  
tcanta None known

dwatta Analgesic ExpectoantThe dried plant is used medicinally in Vietnam[283]. The leaves are used in the treatment of dyspepsia and colic whilst the flowers and roots are used as a reconstituent[283]. Analgesic, expectoant. Used as a gargle for sore throats etc[174].

propta Seed - best sown in a cold frame as soon as it is ripe in the summer[134]. Stored seed will require 3 weeks cold stratification and should be sown in late winter[134]. The seed usually germinates in the spring in 1 - 4 or more weeks at 18°C[134]. When large enough to handle, prick the seedlings out into individual pots and grow them on in light shade in the greenhouse for at least their first winter. Plant them out when large enough in late spring. Division in spring or autumn. Plants are slow to increase[200]. It is best to pot the divisions up and keep them in light shade in the greenhouse until they are growing away strongly.

nwatta Prefers a rich moist neutral to acid soil in woodland or a shady position in the rock garden[1, 200]. Plants are hardy to at least -15°C[200]. The flowers are malodorous and are pollinated by flies[200]. Plants often self-sow when growing in a suitable position[200].

## 7.2.493 Garrya fremontii

Fever Bush, Bearbrush

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 3 m hkuc pcmhmimhtut cyutli hgatyuctcup hwicli hyhisrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli nyanhjen hjonli

drutta Garrya fremontii is an evergreen Shrub growing to 3 m (9ft) by 3 m (9ft) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). . The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers dry or moist soil and can tolerate drought. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

used in the treatment of traumatic pain, haematemesis, gonorrhoea, post-partum vaginal discharge, amenorrhoea and snakebites[147].

propta Seed - surface sow in a greenhouse and keep the compost moist in a light position. The seed can be very slow to germinate, sometimes taking a year or more[134]. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division. Basal cuttings from tubers in spring. Bulblets, formed in the leaf axils. Harvest in the autumn and store overwinter in a cool frost-free place, plant out in spring[200].

nwatta Landscape Uses:Border, Container, Foundation, Massing, Specimen, Woodland garden. Requires a well-drained soil[200]. Does not require high light intensities[200], succeeding in full sun or partial shade[233]. Prefers a pH between 6 and 7[200]. Plants tolerate temperatures down to about -5°C, and can be grown outdoors in the milder areas of the country if given the shelter of a wall[200]. This same report gives the plant a hardiness zone rating of 6 (tolerating temperatures down to about -20°C)[200]. Grows well outdoors in Cornwall amongst trees and shrubs[166]. There are some named varieties selected for their ornamental value[200]. Special Features: Attractive foliage, Naturalizing, Fragrant flowers.

## 7.2.507 Argemone albiflora

White Prickly Poppy, Bluestem pricklypoppy  
6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1.5 m hkuc htut cyutli hgatyuctcup hwicli hyhisras hpa7tli flatprikliwis hpa7tmwatli fyfxtre7t hjonli

drutta Argemone albiflora is a ANNUAL growing to 1.5 m (5ft) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to August, and the seeds ripen from July to September. The species is hermaphrodite (has both male and female organs). The plant is self-fertile. Suitable for: light (sandy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

kcaakta None known  
tcanta None known

dwatta Demulcent Emetic Purgative SkinA tea made from the leaves is demulcent, emetic and purgative[222]. Caution is advised, the seed oil can cause glaucoma and an oedema[222]. An infusion of the plant is used in the treatment of jaundice, skin ailments, colds, colic and wounds[222].

propta Seed - sow April in situ[200]. The seed usually germinates in 3 - 4 weeks at 15°C[134].

nwatta Easily grown in ordinary light soil in a sunny position[200]. Does best in a poor well-drained soil, often self-sowing on stony and sandy sites[200]. Plants resent root disturbance and are best sown in situ[134].

## 7.2.508 Ceratostigma willmottianum

Chinese Plumbago, Chinese Leadwort

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli kyuctcup hwicli hyhisrasjlut hpa7tli flatprikliwissip hpa7tmwatli xre7t hjonli

drutta Ceratostigma willmottianum is a deciduous Shrub growing to 1 m (3ft 3in) by 1 m (3ft 3in) at a medium rate. See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta None known  
tcanta None known

dwatta BachThe plant is used in Bach flower remedies - the keywords for prescribing it are 'Distrust of self', 'Doubt of one's ability' and 'Foolishness'[209].

propta Seed - we have no details for this species but suggest sowing the seed in a greenhouse in the spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Division of rooted suckers in the spring[200]. Layering in the spring. Plants often self-layer[200]. Cuttings of half-ripe wood in a closed frame[200]. Plants should be overwintered in a frost-free frame or greenhouse for their first winter[200].

nwatta Landscape Uses:Border, Foundation. Prefers a light moderately fertile and retentive soil with good drainage, though it tolerates poor dry soils[200] and grows well on chalk[11]. Requires a sunny position[11, 200]. Plants are not fully hardy in Britain, especially if treated as shrubs, but if treated as herbaceous perennials they succeed outdoors in areas where winter temperatures do not fall below about -10 to -15°C[200]. When the woody stems survive the winter it is best to prune them hard in the spring in order to obtain better flowering[11]. Plants flower best on the current years growth[200]. Most, if not all the plants in cultivation in Britain, derive from an original two plants raised from seed in 1908[11]. Plants in this genus are notably resistant to honey fungus[200]. Members of this genus are rarely if ever troubled by browsing deer[233]. Special Features: Blooms are very showy.

## 7.2.509 Ferula persica

6 tlin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli fyfxtre7t hjonli

drutta Ferula persica is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from May to July. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcaakta Edible Parts: Edible Uses: GumNone known  
tcanta GumThe gum 'Sagapenum' is obtained from the plant (from the root?). It is used in the treatment of rheumatism and lumbago[46, 61, 64].

dwatta AntirheumaticAntirheumatic[46, 61, 64]. It is used in the treatment of rheumatism and backache[254].

propta Seed - best sown as soon as the seed is ripe in a greenhouse in autumn[1]. Otherwise sow in April in a greenhouse. Prick out the seedlings into individual pots as soon as they are large enough to handle. Plant them out into their permanent positions whilst still small because the plants dislike root disturbance[1]. Give the plants a protective mulch for at least their first winter outdoors. Division in autumn. This may be inadvisable due to the plants dislike of root disturbance.

nwatta Succeeds in most soils[1]. Requires a deep fertile soil in a sunny position[200]. Plants have a long taproot and are intolerant of root disturbance[200]. They should be planted into their final positions as soon as possible.

## 7.2.510 Swertia chirayita

Chiretta

6 tlin 9 cyuc 0 kcaak 0 tcan 3 dwat 1 m hkuc hmim cyutli tcuphja7n hwicli hrasjlutnyik hpa7tli flatprikliwis hpa7tmwatli xre7t hjonli

drutta Swertia chirayita is a ANNUAL growing to 1 m (3ft 3in) by 0.5 m (1ft 8in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from September to October. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist or wet soil.

kcaakta None known  
tcanta None known

dwatta Digestive Hepatic Malaria StimulantChiretta is a traditional Ayurvedic herb. A strongly bitter tonic it is an



both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta MusicalA kind of flute is made from the hollow stems[272].

dwatta PouliticeThe leaves are used as an external cooling application to alleviate the pains of wounds and bruises[240]. A paste of the root is applied as a poultice to treat dislocated bones[272].

propta Seed - best sown as soon as it is ripe in a cold frame in the autumn. The plant has delayed epigeal germination and will often germinate in the spring but can take up to 2 years especially if the seed is stored prior to being sown[134]. An alternative is to mix the seed with some moist leafmould and seal it in a plastic bag. Keep this at a temperature of 20°c for 3 weeks then pot up any seed that germinates and place the rest in a fridge for 4 - 5 weeks at 3 - 5°c before sowing in a warm place[138]. Seedlings should be grown on in pots in a shaded position in a cold frame or greenhouse for 3 - 4 years before planting them out in their permanent positions[138]. Bulblets are obtained from the base of the old plant after flowering. Pot up and plant out when well established.

nwatta Prefers a moist well-drained position in shade and a soil that is rich in leafmould[47, 200]. Requires a deep, very fertile humus-laden soil[233]. Prefers growing in woodland conditions[42, 200]. A monocarpic plant, the bulb takes about 7 years to reach flowering size but then dies after flowering. However, it produces a number of new bulblets at the base and can be propagated by these[47, 200]. These bulblets take 3 - 5 years to flower[200]. The flowers scent the surrounding area with their rich sweet perfume[245]. When planting, only just cover the bulb with leafmould[47]. The bulb is very attractive to slugs, mice and voles and may require protection[200]. Plants seem to be immune to the predations of rabbits[233].

### 7.2.504 *Thalictrum simplex galioides*

6 tlin 9 cyuc 0 kcak 0 tcan 1 dwat 1 m hkuc hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Thalictrum simplex galioides* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardness. It is hardy to UK zone 7. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects, wind. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta DiureticDiuretic[61].

propta Seed - best sown as soon as it is ripe in the autumn in a cold frame[K]. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. The seed can also be sown in an outdoor seedbed in spring[111]. Plant them into their permanent positions the following spring. Division in spring as new growth commences or in the autumn[111]. Larger divisions can be planted out direct into their permanent positions. We have found that it is best to pot up smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing away well. Plant them out in the summer or the following spring.

nwatta Succeeds in most fairly good soils in sun or semi-shaded[1, 111]. Members of this genus are rarely if ever troubled by browsing deer[233]. A greedy plant, inhibiting the growth of nearby plants, especially legumes[54]. This species is closely related to *T. lucidum*[200].

### 7.2.505 *Codonopsis tubulosa*

6 tlin 9 cyuc 0 kcak 0 tcan 3 dwat 1.5 m hkuc hmimhtut cyutli tcup hwicli hrasjlut hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Codonopsis tubulosa* is a PERENNIAL CLIMBER growing to 1.5 m (5ft). See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from June to August, and the seeds ripen from August to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known

tcanta None known

dwatta Adaptogen Aphrodisiac TonicThis species is an important herb in Chinese medicine, the root is widely used as a substitute for ginseng[238]. It is a sweet, warm, soothing herb that is taken as an energy tonic[238]. It acts mainly on the spleen, lungs and stomach, raising secretion of body fluids and blood sugar levels, lowering the blood pressure and stimulating the immune system[238]. It is taken internally in the treatment of low energy, poor appetite and digestion, anaemia, shallow breathing and debility after illness[238]. It is often cooked with rice until it is glutinous as a tonic food[238]. The roots of plants at least three years old are harvested in the autumn and can be used fresh or dried[238].

propta Seed - surface sow in spring to early summer in an ericaceous compost in a greenhouse. Do not allow the compost to dry out. The seed usually germinates in 1 - 6 weeks at 20°c[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle and grow them on in a greenhouse for their first winter. Plant out in late spring or early summer and protect them from slugs until the plants are well established[K]. Division in spring, with care, since the plant resents root disturbance[200]. We have found it best to take small divisions that are teased out from the sides of the main clump so as to cause the least possible disturbance to the plants and to avoid having to dig up the clump. These small divisions need to be potted up and placed in light shade in a greenhouse until they are rooting well. They can be planted out into their permanent positions in the summer if they are large enough, otherwise in the following spring[K].

nwatta Prefers a well-drained fertile light soil in full sun or semi shade[1, 200]. It only succeeds in full sun if the soil remains moist during the growing season[200]. Prefers a slightly acid soil[164]. Quite cold-hardy when dormant, the young growth in spring, even on mature plants, is frost-tender and so it is best to grow the plants in a position sheltered from the early morning sun[K]. An important herb in Chinese medicine, it is widely cultivated there and is used as a ginseng substitute[238]. A climbing plant, supporting itself by twining and scrambling over other plants[219]. Plants resent root disturbance and should be planted out into their permanent position as soon as possible[164]. Plants are very susceptible to the ravages of slugs. The young shoots in spring are particularly at risk, though older growth is also eaten[K].

#### 7.2.506 *Begonia grandis evansiana*

Hardy Begonia

6 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 1 m hkuc hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli hjonli

drutta *Begonia grandis evansiana* is a PERENNIAL growing to 1 m (3ft 3in) at a medium rate. See above for USDA hardness. It is hardy to UK zone 6. It is in flower from July to August, and the seeds ripen from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta This species can be grown as a ground cover in a sunny position sheltered by shrubs. The plants form spreading clumps[208].

dwatta Anodyne Antiphlogistic AntispasmodicThe tuberous roots and fruits are anodyne, antiphlogistic and antispasmodic. Stimulates blood circulation[147]. A decoction is

kcakta None known

tcanta None known

dwatta Antiperiodic TonicThe leaves are intensely bitter and are used as an antiperiodic and tonic[4]. They can be used as a quinine substitute[4].

propta Seed - best sown as soon as it is ripe in a cold frame. Very slow, the seed can take 2 or more years to germinate. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. Cuttings of half-ripe wood 10cm with a heel, August in a frame[200]. Cuttings of mature wood 10 - 12 cm with a heel, December/January in a frame[200].

nwatta Prefers a sunny position succeeding in most well-drained fertile soils[182, 200, 202]. Succeeds in a hot dry position. Succeeds in light shade[202], the plants are also tolerant of quite deep shade[219]. Does not require a rich soil or abundant moisture[11], if the soil is too fertile the flowering will be delayed[200]. Resistant to urban pollution and maritime exposure but are subject to wind scorch from cold drying winds in colder areas[200]. Hardy to about -15°c[184], it is best on a sunny wall in most parts of the country but does very well as a free standing shrub in Devon and Cornwall[11]. In cold winters and springs the previous year's leaves may fall before the new leaves are produced[202]. The plant strongly resents root disturbance[1, 11] and should be placed in its permanent position as soon as possible. The plant flowers on wood produced the previous summer[200]. All pruning should be carried out in spring before new growth starts but after flowering has ended[1]. Dioecious. Male and female plants must be grown if seed is required.

#### 7.2.494 *Rhododendron molle*

Chinese Azalea

6 tlin 9 cyuc 0 kcak 0 tcan 1 dwat m hkuc hmim cyutli tcup hwicli hrasjlut hpa7tli frusflat hpa7tmwatli xre7t hjonli

drutta *Rhododendron molle* is a deciduous Shrub growing to 2.5 m (8ft 2in). See above for USDA hardness. It is hardy to UK zone 7. It is in flower in May. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: mildly acid soils and can grow in very acid soils. It can grow in semi-shade (light woodland). It prefers moist soil.

kcakta None known

tcanta InsecticideThe powdered flowers have a mild insecticidal effect[57].

dwatta Anaesthetic Analgesic SedativeThe flowers are analgesic, anaesthetic and sedative[218]. They are applied externally in the treatment of arthritis, caries, itch, maggots and traumatic injuries[218]. The root is used in the treatment of arthritis, rheumatism and traumatic injuries[218].

propta Seed - best sown in a greenhouse as soon as it is ripe in the autumn and given artificial light. Alternatively sow the seed in a lightly shaded part of the warm greenhouse in late winter or in a cold greenhouse in April. Surface-sow the seed and do not allow the compost to become dry[200]. Pot up the seedlings when they are large enough to handle and grow on in a greenhouse for at least the first winter. Layering in late July. Takes 15 - 24 months[78]. Cuttings of half-ripe wood, August in a frame. Difficult[78].

nwatta Succeeds in a most humus-rich lime-free soils except those of a dry arid nature or those that are heavy or clayey[1]. Prefers a peaty or well-drained sandy loam[1]. Succeeds in sun or shade, though it prefers a shady position[1]. A pH between 4.5 and 5.5 is ideal[1]. Succeeds in a woodland though, because of its surface-rooting habit[200], it does not compete well with surface-rooting trees[1]. Plants need to be kept well weeded, they dislike other plants growing over or into their root system, in particular they grow badly with ground cover plants, herbaceous plants and heathers[200]. Plants form a root ball and are very tolerant of being transplanted, even when quite large, so long as the root ball is kept intact[200]. A very ornamental plant[1], it is the parent of many cultivars[11]. Plants in this genus are notably susceptible to honey fungus[200].

### 7.2.495 *Skimmia japonica*

Japanese Skimmia

6 tlin 7 cyuc 0 kcak 0 tcan 1 dwat 2 m hkuc pcmimhmhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flat-priklwis hpa7tmwatli nyanhjen hjonli

drutta *Skimmia japonica* is an evergreen Shrub growing to 2 m (6ft) by 2 m (6ft) at a slow rate. See above for USDA hardness. It is hardy to UK zone 7. It is in leaf all year, in flower from April to May, and the seeds ripen from October to December. The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in full shade (deep woodland) semi-shade (light woodland) or no shade. It prefers moist soil. It can tolerate atmospheric pollution.

kcakta None known

tcanta Plants can be grown as a ground cover when planted about 1 metre apart each way[208].

dwatta Carminative Restorative TonicThe poisonous stems are carminative, restorative and tonic[178, 218].

propta Seed - can be sown as soon as it is ripe in a cold frame[K]. It also succeeds when sown in early spring. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in a shady position in the cold frame for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. If there is sufficient seed then it can be sown can be in an outdoor seedbed in early spring[200]. Grow the plants on in the seedbed for a couple of years before planting them out in late autumn or early spring. Cuttings of half-ripe wood, July/August in a cold frame[11]. Cuttings of nearly mature side shoots, 7 - 10cm with a heel, September in a cold frame. Slow to root, they should be left for 18 months before moving to their permanent positions. Good percentage[78]. Layering in autumn. Takes 18 months. Good to high percentage[78].

nwatta Landscape Uses:Border, Container, Foundation, Pest tolerant, Massing, Woodland garden. Succeeds in a well-drained open loam or in a peaty soil[11, 200] preferring a rich slightly acid soil[184]. Thrives in moderately shady positions[11, 200] but also succeeds in full sun where the leaves may be rather yellow but the plant will flower and fruit better[200]. Plants are very tolerant of atmospheric pollution[184], being unharmed by deposits of soot or a sulphur-laden atmosphere[245]. Plants are hardy to about -15°c[184]. Often cultivated in the ornamental garden, there are many named varieties. The flowers have a sweet perfume[245]. Those of male forms are more aromatic than females[1], whilst the variety 'Fragrans' has a stronger scent like lily of the valley[245]. The bruised leaves are pleasantly aromatic[245]. The fruit is seldom eaten by birds, usually hanging on the plant until it flowers the following year[182]. A polymorphic species, it is usually dioecious but some forms are hermaphrodite, especially in ssp. reevesiana. (Fortune.)N.P.Taylor. and Airey Shaw[200]. This sub-species is intolerant of chalky soils[182] and is also much taller than the type. Another report says that it is smaller and weaker-growing than the type species[188]. Special Features:Not North American native, Fragrant flowers, Attractive flowers or blooms.

### 7.2.496 *Ipomoea purpurea*

Common Morning Glory, Tall morning-glory

6 tlin 9 cyuc 0 kcak 0 tcan 2 dwat 2.5 m hkuc htut cyutli tcup hwicli hrasjlutnyik hpa7tli flatpriklwis hpa7tmwatli xre7t hjonli

drutta *Ipomoea purpurea* is a ANNUAL CLIMBER growing to 2.5 m (8ft 2in) at a fast rate. See above for USDA hardness. It is hardy to UK zone 7 and is not frost tender. It is in flower from July to September. The species is hermaphrodite (has both male and female organs). Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known

tcanta None known  
dwatta Anthelmintic Diuretic Hallucinogenic LaxativeThe seed is anthelmintic, diuretic and laxative[176]. It is used in the treatment of oedema, oliguria, ascariasis and constipation[176]. The seed contains small quantities of the hallucinogen LSD[200, 219]. This has been used medicinally in the treatment of various mental disorders.

propta Pre-soak the seed for 12 hours in warm water, or scarify the seed, and sow in individual pots in a greenhouse in early spring. The seed usually germinates in 1 - 3 weeks at 22°C. Plants are extremely resentful of root disturbance, even when they are quite small, and should be potted up almost as soon as they germinate[219]. Grow them on fast in the greenhouse and plant them out into their permanent positions after the last expected frosts. Consider giving them some protection such as a cloche until they are growing away actively.

nwatta Landscape Uses:Arbor, Container, Specimen. Requires a fertile well-drained loam in a sunny position[200]. The plant is not very frost hardy, but it can be grown outdoors as a tender annual in temperate zones[200]. A very ornamental plant, there are several named varieties[200]. The flowers are blue, but they turn more pink later in the day[260]. Special Features: Not North American native, Wetlands plant, Attractive flowers or blooms.

## 7.2.497 *Inula racemosa*

6 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 2 m hkuc  
htut cyutli tcup hwicli hrasjlutnyikfrip hpa7tli flatprikwils hpa7tmwatli fyifxre7t hjonli

drutta *Inula racemosa* is a PERENNIAL growing to 2 m (6ft) by 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from July to August, and the seeds ripen from August to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, flies. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers moist soil.

kcakta None known  
tcanta None known  
dwatta AnalgesicThe rhizome is used in Tibetan medicine, it is said to have a sweet, bitter and acrid taste with a neutral potency[241]. It is used in the treatment of contagious fevers that have not fully ripened and pain in the upper body, especially between the neck and the shoulders[241].

propta Seed - sow spring or autumn in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn[111].

nwatta Succeeds in a sunny position in ordinary garden soil[1]. Requires a moist well-drained soil in sun or partial shade[187]. Grows well in heavy clay soils. A vigorous plant, it can be naturalised in the wild garden or other informal positions[200]. Plants take some years to become fully established[233].

## 7.2.498 *Eupatorium lindleyanum*

6 tin 9 cyuc 0 kcaak 0 tcan 2 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwils hpa7tmwatli xre7t hjonli

drutta *Eupatorium lindleyanum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from September to October, and the seeds ripen from October to November. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta HairUsed as a hair tonic[178]. The leaves, added to a hair pomade, promote the growth of the hair[218].

dwatta Anthelmintic Antidote Antitussive Diuretic Dysentery Restorative Women's complaintsThe whole plant

is anthelmintic, antidote, antitussive, diuretic and restorative[178, 218]. It is used internally in the treatment of bronchitis and dysentery[238]. Externally, it is applied to swellings and wounds and is also important in the treatment of women's complaints, especially before and after parturition[218]. It is also used in the treatment of parasitic worms[218]. The leaves and stems are harvested in the summer before the flower buds open, and are dried for later use[238].

propta Seed - sow spring in a cold frame and only just cover the seed. Prick out the seedlings into individual pots when they are large enough to handle and plant them out into their permanent positions in the summer. Division in spring or autumn[111]. Very easy, the clumps can be replanted direct into their permanent positions.

nwatta Requires a sunny position, succeeding in most well-drained but moisture retentive fertile soils[1]. Plants seem to be immune to the predations of rabbits[233]. There are both diploid and polyploid forms of this species. Whilst the diploids reproduce sexually, the polyploids, which are widespread, produce their seeds without sexual fertilization[275].

## 7.2.499 *Geranium pusillum*

Small geranium  
6 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
htut cyutli kyuctcup hwicli hrasjlutnyik hpa7tli flatprikwils hpa7tmwatli fyifxre7t hjonli

drutta *Geranium pusillum* is a PERENNIAL growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower from June to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

kcakta None known  
tcanta None known  
dwatta Anodyne Astringent VulneraryThe plant is used as an anodyne, astringent and vulnerary[240].

propta Seed - sow spring in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and plant them out in the summer. Division in spring or autumn. Larger clumps can be replanted direct into their permanent positions, though it is best to pot up smaller clumps and grow them on in a cold frame until they are rooting well. Plant them out in the spring.

nwatta We have very little information on this species and do not know if it will be hardy in Britain, though judging by its native range it should succeed outdoors in many parts of this country. The following notes are based on the general needs of the genus. Succeeds in any moderately fertile retentive soil in a sunny position[200]. Tolerates a wide range of soil types[200]. Members of this genus are rarely if ever troubled by browsing deer or rabbits[233].

## 7.2.500 *Hebe speciosa*

New Zealand hebe  
6 tin 9 cyuc 0 kcaak 2 tcan 0 dwat 1.5 m hkuc  
htut cyutli tcup hwicli hyishrasjlut hpa7tli flatprikwils hpa7tmwatli xre7t hjonli

drutta *Hebe speciosa* is an evergreen Shrub growing to 1.5 m (5ft). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from August to September. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees. Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers moist soil. The plant can tolerate maritime exposure. It can tolerate atmospheric pollution.

kcakta None known  
tcanta Hedge HedgeSucceeds as an untrimmed hedge in maritime areas, tolerating maritime exposure[75, 200]. Attractive flowers.

dwatta None known

propta Seed - we have no information on this species but suggest sowing the seed in a greenhouse in spring. Only just cover the seed and do not allow the compost to dry out. Prick out the seedlings into individual pots when they are large enough to handle. Grow on the young plants for at least their first winter in a greenhouse and plant out in late spring or early summer after the last expected frosts. It would probably be worthwhile giving some protection to the plant for its first winter outdoors. Cuttings of half ripe wood, 3 - 5cm with a heel, July/August in a frame. Pot up when roots are forming and keep in a frame or greenhouse for its first winter before planting out in late spring. Cuttings of mature wood, late autumn or winter in a frame.

nwatta Succeeds in most soils so long as they are not boggy or too dry[182]. Prefers a light well-drained soil[1, 166] and a sunny position[200]. Prefers a moist rich soil[166] but plants are probably harder in a soil that is on the poor side[1]. Lime tolerant[11]. Intolerant of drought[166]. Tolerates atmospheric pollution[200]. Very wind resistant, withstanding maritime exposure[166]. Very ornamental[1]. A good butterfly plant[30]. A polymorphic species[200], it hybridizes freely with other members of this genus. Plants in this genus are notably resistant to honey fungus[200]. In garden design, as well as the above-ground architecture of a plant, root structure considerations help in choosing plants that work together for their optimal soil requirements including nutrients and water. The root pattern is clumping, giving the plant a clumping habit. The predictable growth behaviour makes it easier to maintain without having to apply containment methods[2-1].

## 7.2.501 *Angelic sinensis*

Dang Gui - Dong Quai - Chinese Angelica  
6 tin 9 cyuc 0 kcaak 0 tcan 5 dwat 1 m hkuc  
hmimhtut cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwils hpa7tmwatli fyifxre7t hjonli

drutta *Angelic sinensis* is a PERENNIAL growing to 1 m (3ft 3in) by 0.7 m (2ft 4in). See above for USDA hardiness. It is hardy to UK zone 7 and is not frost tender. It is in flower from August to September, and the seeds ripen from September to October. The species is hermaphrodite (has both male and female organs) and is pollinated by Insects. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It can grow in semi-shade (light woodland) or no shade. It prefers moist soil.

kcakta None known  
tcanta This plant is said to contain vitamin B12[176].

dwatta Alterative Analgesic Anticholesterolemic Anti-inflammatory Antispasmodic Cholera Deobstruent Emollient Hepatic Laxative Malaria Sedative Vasodilator Women's complaintsDang Gui is a well-known Chinese herb that has been used in the treatment of female ailments for thousands of years. Its reputation is perhaps second only to ginseng (*Panax ginseng*) and it is particularly noted for its 'blood tonic' effects on women[218]. The root has a sweet pungent aroma that is very distinctive and it is often used in cooking, which is the best way to take it as a blood tonic[254]. One report says that the root contains vitamin B12 and can be used in the treatment of pernicious anaemia[176]. The root is alternative, analgesic, anticholesterolemic, anti-inflammatory, antispasmodic, deobstruent, emmenagogue, emollient, hepatic, laxative, sedative and peripheral vasodilator[165, 176, 218]. It is commonly used in the treatment of a wide range of women's complaints where it regulates the menstrual cycle and relieves period pain[218, 238, 254] and also to ensure a healthy pregnancy and easy delivery[218]. However conflicting information suggests it should not be used during pregnancy [301] and should not be used if menstrual flow is heavy or during menstruation [301]. It is an ideal tonic for women with heavy menstruation who risk becoming anaemic[254]. The water-soluble and non-volatile elements of the root increase the contraction of the uterus whilst the volatile elements can relax the muscle of the uterus[176]. Its use prevents the decrease of liver glycogen and protects the liver[176]. Used for menopausal symptoms (hot flushes) [301]. It has an antibacterial action, inhibiting the growth of various bacteria including *Bacillus dysenteriae*, *Bacillus typhi*, *B. comma*, *B. cholerae* and haemolytic streptococci[176]. The root is an ingredient of 'Four Things Soup',

the most widely used woman's tonic in China[254]. The other species used are *Rehmannia glutinosa*, *Ligusticum wallichii* and *Paeonia lactiflora*[254]. The root is harvested in the autumn or winter and dried for later use[254, 283]. It has been used to treat pulmonary hypertension in combination with the allopathic medication nifedipine [301]. Other uses include: constipation (a laxative), trauma injuries, ulcers, rheumatism and malaria [301].

propta Seed - best sown in a cold frame as soon as it is ripe since the seed only has a short viability[200]. Seed can also be sown in the spring, though germination rates will be lower. It requires light for germination[200]. When large enough to handle, prick the seedlings out into individual pots and grow them on in a cold frame for their first winter, planting them out into their permanent positions in the spring. The seed can also be sown in situ as soon as it is ripe.

nwatta Requires a deep moist fertile soil in dappled shade or full sun[200]. This species is not fully hardy in the colder areas of the country, tolerating temperatures down to at least -5°C[238]. Plants are reliably perennial if they are prevented from setting seed[200].

## 7.2.502 *Daphne laureola*

Spurge Laurel  
6 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 1 m hkuc  
pcimhmm cyutli kyuctcup hwicli jlutnyik hpa7tli flatprik hpa7tmwatli xre7t hjonli

drutta *Daphne laureola* is an evergreen Shrub growing to 1 m (3ft 3in). See above for USDA hardiness. It is hardy to UK zone 7. It is in leaf all year, in flower from February to April. The species is hermaphrodite (has both male and female organs) and is pollinated by Bees, Lepidoptera (Moths and Butterflies). Suitable for: medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid and neutral soils. It can grow in full shade (deep woodland) or semi-shade (light woodland). It prefers dry or moist soil.

kcakta None known  
tcanta None known  
dwatta Abortifacient Cancer Emetic Emmenagogue PurgativeThe leaves have been used as an emmenagogue, though they can cause purging and vomiting[4]. Both the leaves and the bark have been used to procure abortions[4]. The plant contains various toxic compounds and these are currently being investigated (1995) for anti-leukaemia effects[238].

propta Seed - best sown in a greenhouse as soon as it is ripe with the pot sealed in a polythene bag to hold in the moisture. Remove this bag as soon as germination takes place[164]. The seed usually germinates better if it is harvested 'green' (when it has fully developed but before it dries on the plant) and sown immediately. Germination should normally take place by spring, though it sometimes takes a further year. Stored seed is more problematic. It should be warm stratified for 8 - 12 weeks at 20°C followed by 12 - 14 weeks at 3°C. Germination may still take another 12 months or more at 15°C[164]. Prick out the seedlings into individual pots as soon as they are large enough to handle. Grow the plants on in the greenhouse for their first winter and then plant out in spring after the last expected frosts. Cuttings of half-ripe wood, July/August in a frame.

nwatta Prefers a moist soil and a position in semi-shade, growing well in woodlands[11]. Plants are often found growing in dense shade in the wild[245]. A good sandy loam suits most members of this genus[11]. Flowers are produced towards the ends of the previous year's growth[11]. They are sweetly scented[245]. Plants are resentful of root disturbance and should be planted into their permanent positions as soon as possible[188].

## 7.2.503 *Cardiocrinum giganteum*

6 tin 9 cyuc 0 kcaak 0 tcan 1 dwat 1.8 m hkuc  
hmim cyutli tcup hwicli hrasjlutnyik hpa7tli flatprikwils hpa7tmwatli xre7t hjonli

drutta *Cardiocrinum giganteum* is a BULB growing to 1.8 m (6ft) by 0.3 m (1ft in). See above for USDA hardiness. It is hardy to UK zone 7. It is in flower in August, and the seeds ripen in September. The species is hermaphrodite (has